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DYESTUFF REPORTER

Annual Processing Review Number

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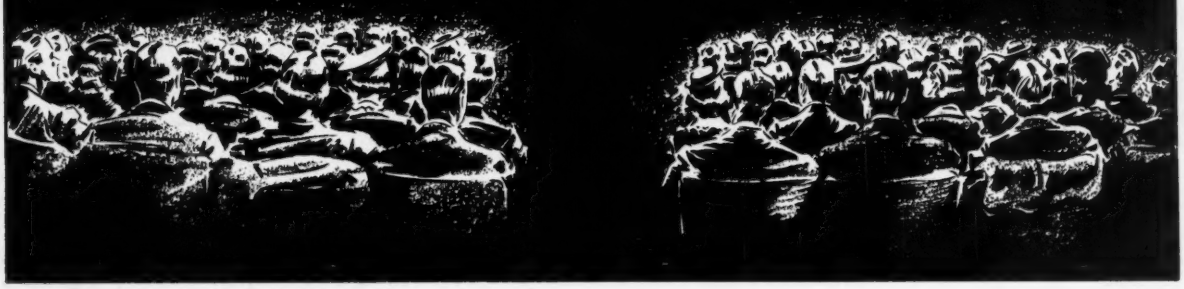

American Cyanamid & Chemical Corporation

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

District Offices 822 West Morehead St., Charlotte, N. C. • 89 Broad Street, Boston, Mass. • 600 So. Delaware Ave., Cor. South St., Philadelphia, Pa.
20 No. Wacker Drive, Chicago, Ill. • 850 Leader Building, Cleveland, Ohio • 1721 Arcade Building, St. Louis, Mo.

American Dyestuff Reporter, Vol. 27, No. 24, November 28, 1938. Published every other Monday. Copyright, 1938, by Howes Publishing Co., 440 4th Ave., New York, N. Y. Domestic subscription, $5.00; Canadian, $6.00, Foreign, $6.00. Entered as second-class matter, Nov. 6, 1919, at the New York, N. Y., Post Office, under the act of March 3, 1879.

Annual Processing Review Number

AMERICAN DYESTUFF REPORTER

A. P. HOWES
Publisher

LOUIS A. OLNEY
Directing Editor

NORMAN A. JOHNSON
Managing Editor

MYRON D. REESER
Advertising Manager

Official Publication of the Proceedings of the American Association of Textile Chemists and Colorists.

NOVEMBER 28, 1938
VOLUME 27 NUMBER 24

American Dyestuff Reporter, Vol. 27, No. 24. November 28, 1938 Published every other Monday. Copyright, 1938, by Howes Publishing Co., 440 4th Ave., New York, N. Y. Domestic subscription, $5.00; Canadian, $6.00, Foreign, $6.00. Entered as second-class matter, Nov. 6, 1919 at the New York, N. Y., Post Office, under the act of March 3, 1879.

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Annual Processing Review Number

AMERICAN
DYESTUFF REPORTER

VOLUME 27 NOVEMBER 28, 1938 NUMBER 24

Alphabetical List of

NEW PRODUCTS FOR TEXTILE WET PROCESSING

DEVELOPED DURING THE PAST YEAR

DYESTUFFS
TEXTILE CHEMICAL SPECIALTIES
EQUIPMENT

Alphabetical List of

MANUFACTURERS

SUPPLYING THESE PRODUCTS

WITH the cooperation of the manufacturers of dyestuffs, textile chemical specialties and wet processing and laboratory equipment we have prepared the following list of products which it is understood have been placed on the market or further developed in the past year. The list of products has been subdivided according to the classification given above and the individual products are listed in alphabetical order. The names of the manufacturers, in an abbreviated form, appear in capital letters immediately following the name of the product. In many cases the abbreviated name of the manufacturer will immediately indicate to the reader the full name of the company. However, supplementing and appearing at the end of the alphabetical list of products, we have listed alphabetically the key name of all the manufacturers whose products are mentioned, together with the complete firm name and address.

We have tried to make this list as complete and accurate as possible but there may be some unintentional omissions or errors. The properties claimed for the products are claims of the manufacturers. We have depended upon the manufacturers to supply us with a complete list of their new products together with information concerning them. It must be understood, in this connection, that the information we have published is necessarily in a brief form inasmuch as lack of space prohibits the publication of complete details concerning any product. We hope, however, that the information that appears is sufficiently comprehensive to give the reader a specific idea of the intended uses and properties of the product. For those products in which you have a particular interest, we would suggest that you write, either to the AMERICAN DYESTUFF REPORTER or directly to the manufacturer, for further details.

DYESTUFFS

A

Acetamine* Diazo Black 3 B—(DUPONT)—produces navy blue to bluish shades of black on all types of acetate fiber materials. It is a dispersed type and is said to show satisfactory fastness toward the majority of color destroying factors, especially to moderate laundering, perspiration and dry cleaning. It can be applied on the reel or jig and is of interest for use on ladies' dress-goods.

* Registered Trade Mark.

Acetamine* Diazo Black G F S (P. A. F.)—DUPONT)—is a non-subliming dyestuff which yields bright greenish shades of black. It is said to disperse satisfactorily, dye levelly and penetrate well and can, therefore, be applied to all types of acetate and acetate-viscose rayon combinations from the reel or jig. It dyes well at low temperatures (160°F.) and shows fastness properties that compare favorably with those of other dispersed "Acetamine" Diazo Blacks.

* Registered Trade Mark.

Acid Anthracene Brown L E—(GENERAL)—may be used either chrome-topped, on a chrome mordant, or according to the chromate method. It dyes reddish brown shades which are said to be distinguished by their particularly good fastness to light; in this respect, it is claimed to be superior to any other chrome brown. The fastness to milling is very good; the fastness to carbonizing, potting and decatizing is good. It also is said to possess very good fastness to water, washing, salt-water, perspiration and alkali. The shade turns only slightly redder under artificial light.

Acid Violet 5 B L—(GENERAL)—dyed from a Glauber's salt-sulfuric acid bath, it produces, on wool, bright violet shades said to be of improved fastness to light, water, washing, salt-water and alkali, compared with the older Acid Violet brands. It is said to have good levelling properties and is also recommended for silk and on wool-silk unions produces uniform shades.

Algosol Green I 3 G—(GENERAL)—will be of considerable interest in dyeing and printing for the production of bright yellowish shades of green said to possess excellent fastness to light and very good fastness to chlorine and to washing. It can be printed according to the chlorate and nitrite process and also according to the neutral chromate-acid aging process alone or in mixture with Rapidogen Yellows.

Alizarine Blue Black B; Alizarine Blue Black 3 B—(NYANZA)—said to be used very extensively on account of their excellent shades and dyeing properties. It is claimed that they are level dyeing and readily soluble and have excellent fastness to light, scouring, fulling, steaming, potting, etc. They are said to be very important colors for the production of greys, light tans, light browns and mode shades for men's wear. They may be dyed top, bottom or nutrachrome method, but the top chrome is recommended for obtaining the best possible fastness. On account of their good solubility, level dyeing properties and excellent penetration it is stated that they may be used in any of the standard machines on either yarns, piece goods, raw stock, slubbing, etc.

Alizarine Cyanine Green C G Extra—(NYANZA)—distinguished by its bright shade of bluish green said to be of exceptionally good fastness to light. It is therefore recommended by the manufacturers for dyeing raw stock, piece goods, carpet and knitting yarn. It is stated that as it has good fastness to salt water it is also suitable for bathing suit yarn. It is further stated that the shade is only slightly affected by aftertreating with bichromate of potash, and furthermore the all around fastness is increased by it and is, therefore, an excellent color for shading chrome, nutrachrome and alizarine colors.

Alizarine Saphirole B—(NYANZA)—a brilliant acid blue of a greenish shade said to be noted for its excellent fastness to light even when dyed in light shades. It is used for dyeing carpet yarns, upholstery, tapestry and curtain fabrics, etc., especially because of its excellent fastness to light. It is also good for hat dyeing. It is stated that fancy unresisted silk effects in woolen pieces are not even tinted if acetic or formic acid is used. Cotton and artificial silk are not stained.

Amacel Blue G G; Amacel Blue G G N—(A.A.P.)—companion colors to Amacel Blue GR which give greener shades possessing similar properties to those obtained with the GR type.

Amacel Blue G R—(A.A.P.)—a bright blue for Celanese rayon which dissolves readily, dyes quickly and evenly, and produces shades said to be of good fastness.

Anthralan Brown 4 G—(GENERAL)—a new, straight, acid brown. It is said to dye very level and to produce bright brown shades of excellent fastness to light; otherwise, it meets, in general fastness properties, the requirements for ladies' dress goods; of interest is its very good fastness to ironing. Effect threads of cotton and rayon are left unstained, whereas acetate is slightly tinted. It is also especially recommended by the manufacturers for dyeing of carpet yarn; it has good affinity for silk and on account of its good affinity from a neutral bath, is recommended for union dyeing.

Artisil Direct Blue 4 G P—(SANDOZ)—a new addition which produces pure greenish shades and is equal in coloring power to Artisil Direct Blue S A P. It is suitable for dyeing ordinary and delustered acetate rayon and has the advantage over the S A P and G P brands in possessing a much superior fastness to light and a greener shade. It surpasses the older fast to light brands such as Artisil Direct Blue B P, B R P, R F P and 2 R P, particularly as regards concentration. It also has better stability in the presence of gas fumes, such as oxides of nitrogen.

B

Benzo Brown B A—(GENERAL)—produces a very good union shade of a deep bluish brown on rayon-cotton, leaving acetate very clear and staining animal fibers only very slightly.

Benzo Fast Bordeaux 5 B L—(GENERAL)—said to possess good fastness to light. It is further said to be very well suited for dyeing of silk-wool unions and of interest to dyers of cotton-rayon yarn and piece-goods. It discharges white, dyed direct as well as diazotized and developed.

C

Calco Pencil Violet C A L Supra—(CALCO)—a basic dye.

Calcocid Black J L N Conc.—(CALCO)—an acid dye for wool.

Calcocid Cocoa Brown—(CALCO)—an acid dye for leather.

Calcocid Neutral Red G D—(CALCO)—an acid dye for silk and wool. It yields full shades of red on silk. It is said to possess very good all around fastness properties. It is suitable for skein or piece dyeing on both pure and

tin weighted silk. It discharges to a pure white. It is also recommended by the manufacturers to dyers of silk hosiery and as a neutral dyeing wool and silk dye on unions.

Calcodur Orange G L—(CALCO)—a direct dye for cotton and rayon.

Calcochrome Brown E B L—(CALCO)—a chrome dye for wool.

Calcochrome Green B B—(CALCO)—a chrome dye for wool, dyeing either top chrome, metachrome or on a chrome bottom yielding a dark bluish green. It is suitable for Vigoreaux printing. It is recommended by the manufacturers for the production of dark greens and shading of such chrome blacks as exhibit a tendency to come up rusty or bronzy. It is said to have good fastness to light, fulling, stoving, carbonizing and cross dyeing for men's wear.

Calcochrome Red Brown 4 R C —(CALCO)—a chrome dye for wool. It may be dyed by any one of the three common methods of application with chrome and yields a terra cotta shade. It is recommended by the manufacturers in the production of livelier shades of brown for men's wear and as a shading color works well on loose wool, tops, yarns and pieces.

Calcochrome Yellow C G W 250 Per Cent; Calcochrome Yellow C G W 100 Per Cent — (CALCO) — two chrome dyes for wool said to possess good fastness to light and fulling, as well as being suited to Vigoreaux printing. They are said to represent exceptional money value in chrome yellows.

Calcofast Gray G N—(CALCO)—an acid dye for wool and leather.

Calcoloid Black A D Double Paste; Calcosol Blue G C D Powder; Calcosol Blue G C D Paste; Calcosol Blue B C S Paste; Calcosol Brown R P Paste—(CALCO)—vat dyes.

Calcoloid Gray G D Paste; Calcoloid Gray B D Paste; Calcoloid Gray R D Paste—(CALCO)—vat dyes, exhibiting similar working properties and said to dye very level from side to side and end to end of the piece for both jig and continuous work and to be also suitable for raw stock or pressure machine dyeing. It is claimed that general all around fastness is rated as excellent.

Calcomine Blue D R—(CALCO)—a direct dye for cotton.

Calcomine Brown B S—(CALCO)—direct dye for cotton and rayon, suitable for dyeing of raw stock, yarn and piece goods. For better fastness properties, the manufacturers recommend an after treatment with copper, chrome and acetic acid.

Calcomine Catechine 2 G; Calcomine Catechine 3 R S—(CALCO)—direct dyes. They are recommended by the manufacturers for cotton mills and bleacheries for pad work, as well as to the acetate and rayon trade. For the silk trade these browns are said to offer good discharge properties. For union dyes they are said to have good all around fastness properties.

Calcomine Formyl Dark Brown R B—(CALCO)—direct dye for cotton and rayon. This dye is particularly suitable for the dyeing of rayon, on which it produces a very deep reddish brown shade. It is also said to be an excellent hosiery color, to discharge to an excellent white and to be very fast to washing. It is further said to be entirely suitable for ground shades which are later to be discharge printed. Aftertreatment with formaldehyde greatly improves the fastness of the dyeing.

Calconese Diazo Black N S; Calconese Diazo Black N S G—(CALCO)—for acetate rayon. They are soluble blacks that are non-subliming and non-crocking. They are said to give quick and perfect penetration and to dye very level at either high or low temperatures. They are further said to possess excellent fastness properties and to be perfect for work on the jig.

Calconese Diazo Navy H S—(CALCO)—for acetate rayon. This non-subliming dye is said to be suitable for all types of acetate materials. It is said to possess good solubility, to dye level and to give excellent penetration. It is stated that it is much faster to light than ordinary diazo navies and is therefore suggested for all high grade styles.

Calconese Direct Black 2 B S; Calconese Diazo Navy S D; Calconese Blue B F; Calconese Blue 2 B R Conc; Calconese Sapphire 2 G S Conc; Calconese Brilliant Turquoise B; Calconese Blue R; Calconese Brown J S; Calconese Brown C; Calconese Brilliant Orange 5 R; Calconese Red P Y C; Calconese Brilliant Red B F W; Calconese Brilliant Scarlet B N—(CALCO)—dyes for acetate rayon.

Calconese Yellow M—(CALCO)—for acetate rayon. This product is said to possess high tinctorial value and to yield a shade of a slightly reddish cast. It is said to dye well at both high and low temperatures, to possess all around good fastness and to be suitable for dyeing goods containing cotton or rayon effects.

Carbanthrene Direct Black R B Paste—(NATIONAL)—a homogeneous vat dye addition applicable to cotton, rayon and silk, yielding a bloomy shade of black said to be of excellent fastness to all the usual color destroying agencies. It does not require a chlorine treatment to develop the shade. Possessing good solubility and being unaffected by metals it is particularly suitable for application in all types of machines, it is claimed. Its excellent dispersion and ease of reduction render it of primary importance for pad-jig work.

Celliton Discharge Scarlet R N L—(GENERAL)—produces on acetate fabrics, bright scarlet shades which can easily be discharged to a pure white by Decroline Soluble Conc.

Celliton Fast Scarlet R N—(GENERAL)—surpasses the older Celliton Fast Scarlet R in fastness to light, perspiration, neutral and acid cross-dyeing, but is practically identical with it in shade and strength.

Chlorantine Fast Green C L L (Patented)—(CIBA)—this dyestuff may be used on Cotton yarn, mercerized cotton, viscose and rayon yarn, bleached cotton goods, viscose rayon crepe, viscose cut staple, viscose rayon knit goods, Bemberg rayon, viscose delustered rayon knit goods, cotton-viscose goods, cotton-acetate goods, viscose-acetate delustered goods and Bemberg-acetate rayon goods. This new type is said to be distinguished for its fastness to light and resistance to the influence of calcareous water. Dyeings made with the addition of Ultravon W or Albatex P O to the dyebath are said to improve the levelling and penetration and to add immensely to the softness of the finish.

Chlorantine Fast Orange G L—(CIBA)—redder and purer in shade than Chlorantine Fast Orange 2 G L. It is suitable for all branches of cotton dyeing and also for rayon. Acetate rayon is reserved.

Chrome Yellow D—(GENERAL)—may be dyed afterchromed, on a chrome mordant and according to the chromate process. It exhausts well when dyed by the silk-white method and leaves silk effects clean. It dyes level and may be used for all kinds of combination shades.

Ciba Brilliant Pink 2 B (Patented)—(CIBA)—It is stated that by virtue of its good dyeing properties and high level of fastness, this new product is suitable for the dyeing of cotton, linen and rayon in the various stages of manufacture such as the loose state, yarns in hanks, chain warp or wound form, piece goods and knitted fabrics.

Cibacete Blue G R—(CIBA)—this is a very productive blue for acetate rayons, which is said to exhibit exceptional exhausting ability. This property makes it available for the dyeing of deep shades, such as navy blues, dark browns and deep greens, without an appreciable waste of

dyestuff. With Cibacete Blue G R pure blue tones may be dyed which are a trace greener than the well known Cibacete Sapphire Blue G. The dyeings are said to be noted for very good fastness to washing, water, perspiration and acids. The levelling property is good, so it may be combined with the best levelling types of the Cibacete series. In mixed fabrics, cotton and rayons are so slightly tinted that it may be safely used for dyeing such materials. Wool and silk are tinted, but may be cleared up considerably by an after-treatment with soap or Ultravon W. Cibacete Blue G R is not suited for printing, either as a direct print or as a discharge ground.

Cibacet Blue R F (Patented)—(CIBA)—dyes a distinctly purer, greener shade on acetate rayon than the older Cibacet Blue B, B R and B R F brands. It also exhausts better from the dyebath and exhibits greater tinctorial value. It is suitable for dyeing acetate rayon in yarn, piece and composite fabrics and is said to possess good level dyeing properties and good fastness to light.

Cibacete Discharge Violet 5 R (Patented)—(CIBA)—a straight color of reddish violet shade said to have very good dischargeability. The dyeings are said to have good fastness to water, washing, perspiration acids and crocking. It is stated that Cibacete Discharge Violet 5 R is also very level dyeing, so that it may be combined with other dischargeable Cibacete colors like Cibacete Yellow G G R, Cibacete Orange 2 R or 4 R, Cibacete Scarlets G and B R, Cibacete Reds G R, G G R and B. Cibacete Discharge Violet 5 R is suited for the dyeing of mixed fabrics containing cotton or viscose. Wool and silk are somewhat tinted but may be cleared by the ordinary methods. Cibacete Discharge Violet 5 R is also adapted for direct or application printing.

Cibacete Sapphire Blue 4 G—(CIBA) noted for its exceptional shade in artificial light, Cibacete Sapphire Blue 4 G is greener, purer and faster to light than the G and G F types. It is suitable for the dyeing of acetate rayon in all stages of manufacture and is of particular utility in making fashion shades in conjunction with Cibacete Yellow G N, G G R, Orange 3 R, 4 R, Red 3 B, B, G G R. In mixed fabrics, cotton and viscose rayon are little tinted while wool and silk are stained and require an after-treatment with soap or Ultravon W for clearing. This new type is of no interest in printing.

Cibacete Yellow G G R—(CIBA)—a recently introduced dyestuff for dyeing acetates in somewhat redder tones than the older type Cibacete Yellow G G N and is said to be fast to sublimation. Cibacete Yellow G G R is a trifle less fast to light than the G G N type but equal in fastness to the G N type. The new product gives dyeings up to 2½ per cent which are dischargeable to a pure white.

Cibanone Blue 2 R, Cibanone Dark Blue M B A and Cibanone Black B A N double conc.—(CIBA)—these colors are shown on materials woven in the grey and later subjected to kier boil and bleach. All three products are said to be especially adapted for resisting the action of kier boiling and bleaching, both with the regular chlorine bleach as well as the combined chlorine-peroxide method. However no speciafic guarantee can be given, on account of the diversity of materials and conditions that may be encountered; in every case it is advisable to make preliminary tests.

Cibanone Brown G R F—(CIBA)—a new vat color which dyes a redder and purer shade of brown than the older Cibanone Brown G R but of the same high degree of fastness. It is said to possess easy solubility, good level dyeing properties, excellent fastness to light, soda boiling, scouring, chlorine, perspiration, hot pressing and resistance to the chlorine-peroxide bleach.

Cibanone Olive B G; Cibanone Olive 2 B—(CIBA)—two new vat colors which are said to possess easy reduction, good solubility and level dyeing properties. The 2 B brand is said to possess excellent fastness to washing, soda boiling, chlorine, hot pressing and peroxide. The B G brand is said to possess excellent general fastness properties but is turned somewhat yellower in shade by chlorine.

Cloth Fast Brilliant Blue R—(CIBA)—a new type in the series of Cloth Fast Colors having a decidedly redder and purer tone than the G type. This new dyestuff is recommended by the manufacturers for lightly fulled goods and fast knitting yarns, on account of its good fastness to light, washing and sea water. On account of its resistance to chroming, Brilliant Cloth Fast Blue may be used for shading chrome mordant dyestuffs, especially in the half-wool-chrome process for union goods and mixtures of wool and cut staple fiber. This product is also of interest in the printing of wool and silk.

Coprantine Colors—(CIBA)—a new series of substantive colors applied on cotton and rayon in the usual manner for direct colors with soda and Glauber's salt and an addition of Coprantine Salt I and yielding shades said to be of good to very good fastness to washing and light.

Coprantine Blue G L L and R L L (Patent Applied For)—(CIBA)—the first members of the Coprantine series. They are said to be suitable for dyeing linen, cotton and rayon in the various stages of manufacture for goods demanding increased fastness to washing and light, such as decorative and upholstery fabrics, etc.

D

Diazine Black H D W—(NATIONAL)—a new developed black similar in properties to Diazine Black H Extra but possessing better dischargeability and appreciably brighter in shade and leaves pure silk whiter than the latter type.

Diazo Bordeaux 7 B Extra Conc.—(GENERAL)—a product which, when diazotized and developed with Developer A, produces full shades of a bluish bordeaux said to possess good fastness to washing, very good fastness to acid, alkali and good fastness to light.

Diazo Brilliant Green G (Patent applied for)—(CIBA)—When developed with Yellow Developer C, this new type gives a brilliant green and is well suited for dyeing cotton or viscose rayon in all stages of manufacture. The developed dyeings are said to be fast to washing, cross dyeing and perspiration. The fastness to light is sufficient for most purposes. Mixtures of cotton and viscose rayon are dyed uniformly, while acetate rayon remains reserved. Diazo Brilliant Green G is adapted for dyeing unweighted silk from a weak acid bath. In mixed fabrics containing wool, the vegetable fibers are dyed a full shade at 140°F., while the wool is but slightly tinted; at a boil the wool is still a much lighter shade and may be brought up to shade with neutral dyeing acid dyestuffs prior to diazotizing and developing. Used as a ground shade on cotton or viscose rayon fabrics, Diazo Brilliant Green G may be discharged to a pure white, hence is of great interest for colored discharge prints.

Diazo Brilliant Orange 6 G Extra—(GENERAL)—produces when diazotized and developed with Developer A, a bright reddish orange and with Developer Z A, a bright golden yellow, both showing excellent dischargeability.

Diazo Brilliant Orange G G A Extra Conc.—(GENERAL)—when diazotized and developed with Developer A, produces on cotton or on rayon bright shades of a yellowish orange; the color is particularly recommended by the manufacturers on account of its very good fastness to washing and its excellent dis-

chargeability. It is said to be valuable for self shades as well as for brown combinations which must be dischargeable.

Diazo Brilliant Scarlet 5 B L N Extra—(GENERAL)—when diazotized and developed with Developer A, produces clear buish red shades on cotton or rayon of very clear dischargeability with both neutral and alkaline discharge pastes. The product is easily soluble and therefore recommended by the manufacturers for machine dyeing. It is said to level well, to be fast to storage to produce good tone-in-tone effects on rayon and cotton and can also be used for pure silk. It is furthermore recommended by the manufacturers for coupling with Nitrazol C F, producing distinctly yellower shades than when diazotized and developed with Developer A.

Diazo Discharge Violet R D—(GENERAL)—produces when diazotized and developed with Developer A, very bright shades of reddish violet on cotton or rayon. The dyeings are said to be fast to washing and to be easily discharged to a very clear white.

Diazo Fast Blue 4 B W—(CIBA)—a new member of the Diazo Fast series, which is said to be noted for its fastness to light and washing. Diazo Fast Blue 4 B W is said to be suited for the dyeing of all combinations of cotton and viscose rayon; the shades are dischargeable to a pure clear white.

Diphenyl Fast Green G L—(GEIGY)—an outstanding contribution to the rapidly growing line of fast to light direct dyestuffs for cotton and rayon, in the same category as Solophenyl Fast Blue Green B L. It is somewhat yellower in shade and because of its ability to leave animal fibers adequately reserved is entirely suited for use on union fabrics. This is true even at high temperatures.

Direct Silk Blue N R—(GENERAL)—a direct dyestuff which produces a full navy blue on both vegetable and animal fibers and leaves acetate unstained. The product produces uniform shades on cotton and rayon or wool and silk, both at the boil as well as around 150°F.

Du Pont Auramine S P Concentrated—(DUPONT)—is a new type particularly recommended by the manufacturers for spirit printing. It is said to be very soluble in alcohol and should find wide use where the straight basic colors are employed.

E

Erio Anthracene Orange R L—(GEIGY)—a new level dyeing acid color said to be of outstanding fastness to light, included in the Geigy range of Erio Anthracene Colors. The new color is said to be characterized by very good solubility and level dyeing properties, relatively good fastness to washing, good fastness to perspiration, and a very good fastness to light, and it can be used in both self and combination shades for the production of all types of fashion shades for knitting, weaving and carpet yarns (of good fastness to chlorine), hats, ladies' dress goods and cheap men's wear. Erio Anthracene Orange R L is also suitable for dyeing unweighted real silk.

Erio Chrome Olive B L (Patented)—(GEIGY)—this product produces a bluish olive shade said to possess good level dyeing qualities. It is further said to possess extreme fastness to weathering and is recommended as a basic shade on uniform cloths where the extreme in fastness is desired. Geigy considers this one of its outstanding contributions in recent years.

F

Fast Dark Blue Salt R—(GENERAL)—produces, on Naphtol A S ground, midnight navy blues said to possess very good light and wash fastness. The dyed grounds of this combination are easily dischargeable.

Fast Orange Salt G G D—(GENERAL)—said to represent another valuable addition to the large range of developers of Naphtol A S ground. Valuable orange shades of yellowish character said to possess all around fastness including hot pressing are obtainable on Naphtol A S, A S—D, A S—O L, A S—S W and A S—L C ground.

Fast Wool Blue E B—(GENERAL)—dyed from a Glauber's salt-sulfuric acid bath, it produces full blue shades said to be of good fastness to light, water, salt-water, washing and perspiration and is especially recommended to the knitting trade. It dyes well from a neutral bath and is therefore, of interest for union dyeing. On pure silk, shades of good fastness to washing are said to be obtained. Fast Wool Blue E B is stable in the Rongalite-discharge.

Fast Wool Blue E G—(GENERAL)—a new acid blue which is said to level well, even from a sulfuric acid bath, and to produce on wool greenish blues of good fastness to light; in fastness to milling, washing, perspiration, water and salt-water, it comes quite close to the Wool Fast Blues. The shade turns only slightly duller in chroming. It is of interest to the hat trade, as it is said to be of better fastness to hot-water than other level dyeing acid blues generally used. It has good affinity for pure and tin-weighted silk, and dyes wool-silk unions a uniform shade. It is stable to Rongalite C and may be used for colored discharges.

Fastusol Blue L B L—(GENERAL)—said to possess excellent fastness to light and good fastness to alkali, acid and rubbing. It levels very well and is easily soluble. It also is recommended by the manufacturers on account of its excellent dischargeability.

Fastusol Blue L F F G G L—(GENERAL)—a new homogeneous product which produces very bright shades on cotton and rayon said to be of excellent fastness to light.

Fastusol Scarlet L G G—(GENERAL)—a new direct color which is said to be distinguished by its high fastness to light and which yields a yellowish shade which in fastness to water, washing and perspiration, is said to be superior to the red dyestuffs in this range.

Fastusol Turquoise Blue L G—(GENERAL)—a direct dyestuff said to be of remarkable brightness and excellent fastness to light. Its bright green blue shades are said to possess a purity which so far was not obtainable with the clearest basic dyestuffs. It is well suited for self and combination shades, particularly for extremely bright greens. It is said to be very level dyeing and therefore recommended for rayon, making it suitable also for penetrating novelty rayon yarns. Good tone in tone dyeings are obtained on mixed fabrics of cotton and rayon and extremely bright shades said to be of very good fastness to light are obtained on pure silk. The dyestuff is said to possess the advantage in union dyeing of leaving wool practically white when an addition of Katanol W L is used. The shades are dischargeable when pigment discharges and an addition of Leucotrope W Conc. are employed. The product can also be used for direct printing on silk.

H

Hydron Blue F B Powder—(GENERAL)—said to produce brighter shades on cotton than were obtainable up to now with this class of dyestuff. The dyeing method and the fastness properties of the new Hydron Blue F B pdr. are the same as they are familiar throughout the trade from the older well known brand, i.e., Hydron Blue R A, G A and B G.

Hydron Printing Blue 3 R Suprafix P D R—(GENERAL)—a highly dispersed vat powder of particular interest for producing smooth prints on pigmented rayon, of a reddish navy.

I

Immedial Bordeaux 3 B L—(GENERAL) — said to produce bordeaux shades of a clarity not previously obtainable with sulfur dyestuffs.

It is said to have good fastness to light, washing, acid, perspiration, hot pressing and rubbing. It is also said to have good levelling properties and dissolve easily and is, therefore, suitable for machine dyeing. Immedial Bordeaux 3 B L can be delivered from copper and manganese.

Indanthren Olive Green G G PDR. Fine for Dyg. — (GENERAL)—a new homogeneous Vat dyestuff of the I N series which produces shades much yellower than Indanthren Olive Green B A. In addition to having good solubility and levelling properties, it also is said to possess maximum fastness to light. On account of its resistance to outside exposure, it is recommended for the dyeing of awning stripes. It furthermore is said to have the important property of covering dead cotton and producing uniform shades on mixed fabrics containing cotton and viscose rayon.

Indanthren Scarlet G K PDR. Fine for Dyeing — (GENERAL) — a new homogeneous Vat dyestuff which will be of considerable interest for the production of pink to scarlet shades on cotton yarn, rayon and also on piece-goods. It is said to be of further particular interest on account of its excellent fastness to light and weather and, therefore, in full dyeings, it is recommended for awnings. It can be satisfactorily applied to piece-goods according to the pigment padding method. It belongs to that class of dyestuffs which are best dyed cold, but for shading purposes, can be also used according to the I W process.

Indanthren Scarlet G K Suprafix—(GENERAL)—recommended for printing on cotton and rayon, producing a bright shade said to be of excellent fastness to light and weather even in very light prints. It is also said to have very good fastness to washing and chlorine.

Indigosol Green I 3 G—(CARBIC)—a new Indigosol which gives bright yellowish Greens said to be of very high fastness. It is suitable for printing, padding or dyeing by any of the processes now in use.

K

Kiton Fast Red B G L E (Pat.Applied For)—(CIBA)—an easy levelling acid dyestuff said to be of very good fastness to light, which is useful not only as a self color, but also in combination with the other easy levelling fast acid colors. Viscose and acetate rayon effects are said to be reserved pure white and the dyeings are easily dischargeable to a pure white with hydrosulfites.

L

Leucosol* Black R A Double Paste (Patented)—(DUPONT)—a vat color which can be used both as a direct printing color and for printing over colored discharge grounds. In either case bluish shades of black are obtained which do not mark off on white grounds on rayon fabrics. The color is said to show good fastness to washing and power laundering with chlorine on cotton, bright and delustered rayon and saponified acetate. It is non-foaming and will not crystallize during storage.

* Registered Trade Mark.

Lithosol* Fast Yellow H L Powder; Lithosol* Fast Yellow Y Powder — (DUPONT)— pigments. These colors are manufactured for use in printing inks, water paints and lacquers. They all are said to demonstrate good resistance to the color destroying factors usually encountered, for example; acids, alkali and baking. These colors show high tinctorial value and do not require a precipitating agent when mixed with bases.

* Registered Trade Mark.

Lithosol* Red 2 B Powder; Lithosol* Red 2 B D Powder—(DUPONT)—lake colors. These types are similar in properties but the latter has a darker mass tone. They are said to be very fast to acids, lacquer solvents, light and baking. They are also said to be non-bleeding in oil, water and alcohol. Both are employed in paints, lacquers, and printing inks.

* Registered Trade Mark.

Lithosol* Scarlet 2 Y L—(DUPONT)—a lake color which was designed for use in printing inks, lacquers, etc. It has a deep mass tone and yellow tint. It is said to possess very good resistance to light, to be non-bleeding in oil and water, and to be unaffected by acids or baking and is fairly fast to alkalies.

* Registered Trade Mark.

Lithosol* Yellow G Concentrated; Lithosol* Yellow G 20% Paste—(DUPONT)—pigments. These two colors produce similar shades possessing similar working and fastness properties, both showing good resistance to light, bleeding in oil, water and alcohol, as well as good fastness to baking. The former being the concentrated type also offers high tinctorial value.

* Registered Trade Mark.

M

Metamine Fast Light Red B L Conc.; Metamine Fast Red 4 B L—(NYANZA)—uniform levelling dyes for wool which are said to possess excellent fastness to light. They are said to be suitable for sweaters, ladies' dress goods and carpet yarns where exceptional light fastness is required. It is stated that owing to their excellent levelling powers combined with extreme fastness to light, these products come into questions not only as self colors but also for mixtures with other levelling dyes that are fast to light, such as Metamine Fast Light Yellow 2 G X and Alizarine Saphirol B.

Metamine Fast Light Yellow 3 G A—(NYANZA)—an acid dyeing pure shade of yellow said to be of good fastness to light and to possess excellent levelling properties. It is recommended by the manufacturers for dyeing carpet yarns, dress goods and mohair plush where fastness to light is of importance. It is said to be a good levelling color and to combine well with other level acid colors for compound shades.

Metomega Chrome Blue 2 R L; Metomega Chrome Blue B B L Conc.—(SANDOZ)—two new additions to the Sandoz range of chrome colors. Both colors may be applied by all the usual methods for chrome colors but are especially recommended by the manufacturers for application by the Metomega Chrome Method, as this process is said to give full color value combined with maximum fastness. They are said to be suitable for the dyeing of wool in all stages of manufacture, loose wool, slubbing, yarn and piece goods, and one of the special features is the very good level dyeing properties on blends containing varied qualities of wool. It is stated that they possess excellent fastness to washing, milling and decatizing and cotton effects are left practically white. The B B L conc. brand is recommended for the production of bluish grey shades and light navy blue tones possessing outstanding fastness to light, and the 2 R L brand for the production of navy blues in conjunction with suitable proportions of the B B L Conc. brand. The fastness to light of these colors is comparable to that of Omega Chrome Black Blue G. It is stated that on account of their level dyeing properties both products may be applied on slubbing and yarn in circulation machines and may also be used satisfactorily in cheese dyeing.

Milling Black B—(NATIONAL)—a new neutral dyeing acid black possessing the general fastness properties of the National Durol Blacks with the added advantage of being readily discharged.

On wool it yields bloomy black shades said to be of excellent fastness to washing, sea water and light—making it particularly valuable for coloring bathing suits and sweater yarns. Drawing well in a neutral bath, it is of particular interest in union dyeing. It is stated that its affinity for pure and tin-weighted silk together with its easy dischargeability render it distinctly valuable to the silk dyeing trade.

Milling Fast Black D N—(NYANZA)—an acid black which is dyed with acetic acid and producing shades said to be of good fastness to washing, milling and salt water. It produces a jet shade of black and is recommended by the manufacturers for dyeing hosiery yarns and bathing suit yarns where fastness to salt water and washing is of importance.

Milling Fast Orange R—(NYANZA)—a bright reddish shade of orange said to be suitable for dyeing wool and silk and on account of its good fastness to washing, light and salt water it is particularly suitable for bathing suit yarns. It is further said to be a useful color for shading chrome colors as it is not affected by the aftertreatment with bichromate of potash.

Milling Fast Red F F—(NYANZA)—produces a bright bluish shade of red when dyed with acetic acid. It is said to be suitable for dyeing wool and silk and to be particularly suitable for dyeing bathing suit yarns where fastness to washing and salt water is of importance. It is also said to have good fastness to light, and as it is not affected by the aftertreatment with bichromate of potash, is a useful color for shading chrome colors.

Milling Fast Red R—(NYANZA)—a yellowish shade of red said to be of good fastness to fulling and light. It is dyed in an acetic acid bath in the usual way for milling colors. It is recommended by the manufacturers for bathing suit yarns where fastness to washing and salt water is required.

Monastral* Fast Blue G S, Monastral* Fast Blue G S W D—(DUPONT)—These pigments are similar in shade, the former being used for printing inks, soap wrappers, paints, lacquers and wallpapers while the latter is employed on papers alone. They are both said to possess superlative fastness to light and good fastness to acid, alkali and chlorine. The G S W D has good tinctorial value and a pure tone, it is water dispersible and develops rapidly in the beater. The G S type is non-bleeding in oil, water and alcohol.

* Registered Trade Mark.

Monastral* Fast Blue B Soluble—(DUPONT) — a pigment which produces bright shades of blue on all grades of paper stock. It develops quickly in the beater and is unaffected by light, chlorine, acid or acid fumes. As a barium salt it can be used for printing inks and wallpapers. It is also employed to produce bright blues on cotton and rayon which are fast to light.

* Registered Trade Mark.

Monastral* Fast Green G S, Monastral* Fast Green G S 20% Pulp—(DUPONT)—Both of these colors are straight unshaded pigment colors producing bright shades of emerald green. The pulp is suitable for flushing in oil for printing inks. The G S type is said to show good fastness to light, alkali, acids and lime and to be non-bleeding in oil, water and alcohol. It is of use in the printing ink, lake and allied industries.

* Registered Trade Mark.

N

Nacelan Brilliant Blue N R—(NATIONAL)—a recent addition of a bright reddish shade of blue for acetate rayon, possessing the same excellent light fastness as Nacelan Blue N A and is, likewise, non-phototropic as well as appreciably superior in fastness to washing than the latter type.

Naphtamine Light Brown T W C Conc.—(GENERAL)—a direct color which produces very deep tobacco shades on cotton and rayon and dyes good unions on these fibers, also wool and silk, leaving acetate rayon a very clear white.

Neocotone Colors—(CIBA)—a new series of patented dyestuffs which are said to be particularly suitable for printing on cellulosic fibers. It is stated that the entire line is water soluble and may be fixed by a short steaming (not acid), followed by a treatment in a dilute caustic soda bath. It is further stated that these colors are definitely stable either in powder form or in acid and neutral printing pastes. It is claimed that they are suitable for both direct printing and padding. Padded shades are dischargeable to a pure white and may be used as grounds for color discharges. Outstanding advantages claimed for these colors are:

Fastness to light; fastness to washing; do not require acid ageing; in printing, appear in the shade of the finished color, thus giving complete visibility without any sightener; can be used with aniline black; do not require the use of solubilized vat colors, but can be run with and fitted to regular vat printing pastes.

It is stated that the final result of a Neocotone print is comparable to the best of the naphthols, without the necessity of a special naphthol prepare. It is further claimed that they surpass the working properties of all other prepared azoic colors in being visible at all times and not requiring a passage in an acid ager. It is also said that they will make possible many savings in total costs because they do not require the use of special solubilized or esterified vat dyes to work with them, but may be printed beside ordinary vat dyes, as well as aniline black.

Neocotone Scarlet G—(CIBA)—the first member of the neocotone series which is suitable for application to all forms of cotton and viscose rayon. The resultant bright prints are said to be of good fastness to light, washing, chlorine, perspiration and crocking.

Neolan Bordeaux B E (Patent Applied For)—(CIBA)—similar in shade and general properties to the older Neolan Bordeaux B but of superior level dyeing properties. It is said to possess a high degree of fastness to washing, water, perspiration and also very good fastness to light, carbonizing and decatizing.

Neolan Yellow 6 G E—(CIBA)—slightly duller in shade but of decidedly better levelling qualities than Neolan Yellow 6 G. Neolan Yellow 6 G E is said to be very well suited for dyeing both wool yarns and wool pieces, especially as an easy levelling shading color. It exhausts on silk just like Neolan Yellow 6 G, but on tin weighted silk somewhat less. The new dyestuff is suited for direct printing on wool, silk and especially on viscose. Dyeings on wool and silk are said to be dischargeable to a pure white with hydrosulfites.

Neolan Yellow 8 G E (Patented)—(CIBA)—a new level dyeing yellow which dyes a greener shade than the 6 G E brand and is said to possess very good fastness to light, perspiration, decatizing, water and sulfur stoving.

Neutral Brown for Silk G—(GEIGY)—this is considerably yellower in shade than the Fast Silk Brown R type and while not suited to the one bath method, will find good use for the two bath hosiery dyeing method—moreover proving of use to plants dyeing pure dye and tin weighted silk and in cases where animal fibers present a problem in multi-fibered fabrics.

Neutral Orange R X—(GEIGY)—a fast drawing, neutral dyeing dyestuff, said to possess extremely good fastness to light and excellent fastness to washing and light fulling on woolen materials. It has high efficiency in a neutral dyeing bath, approximately 75 per cent of the color exhausting without the use of

acid. It can be used efficiently for filling in wool and union materials and for dyeing mohair pile fabrics where temperatures are usually under 180° F.

Neutral Yellow G X—(GEIGY)—a neutral dyeing color for animal fibers, said to possess better than average fastness to light. It is extremely interesting for multi-fibered work because of its ability to leave extraneous fibers adequately reserved. It is said to have an extremely high, general all-around fastness rating which will include light, water, alkali, perspiration, hot pressing, stoving, sulfite and acid milling. It is excellent for discharge.

Niagara Brilliant Blue B F L—(NATIONAL)—a bright reddish shade of direct blue yielding a more uniform shade on cotton and rayon unions as well as on barre rayon, as compared with other direct blues. Applied to cotton, rayon and pure silk it yields full shades and discharges readily on these fibers. Acetate rayon effect threads are unstained.

Nyagene Dark Brown B; Nyagene Rubine B; Nyagene Brilliant Scarlet 2 B L Extra Conc.; Nyagene Fast Violet 2 RL—(NYANZA)—additions to the group of well known Nyagene colors which are said to be of good fastness to washing when diazotized and developed for cotton, rayon and silk.

Nyanza Potting Black P V; Nyanza Potting Black P 2 B—(NYANZA)—chrome blacks which are said to have outstanding fastness to potting. They are best dyed by the afterchrome method and are said to be suitable for yarns, slubbing and piece goods where good fastness to fulling and potting are required. It is said to have outstanding fastness to cross dyeing with acid colors, in this respect being one of the fastest colors obtainable.

P

Paranol Chrome Black Blue B — (NYANZA)—a direct blue which is particularly recommended by the manufacturers for dyeing navy blues on rayon on account of its good fastness to washing. It is also said to be suitable for aftertreatment with bichromate of potash which greatly increases the fastness to washing. It is further said to give a pure white discharge with hydrosulfite.

Paranol Fast Blue 4 G L; Paranol Fast Blue F F L—(NYANZA)—direct blues suitable for cotton and rayon and said to have excellent light fastness. They are recommended by the manufacturers for union dyeing as they cover the cotton without affecting the wool. They are said to give a pure white discharge with hydrosulfite.

Paranol Fast Brown B R L — (NYANZA) — a direct brown suitable for cotton and rayon which is said to be distinguished by its excellent fastness to light. It is further said to be particularly suitable for dyeing tapestries, corduroys, dress goods, etc., where fastness to light is important. It gives a pure white discharge with hydrosulfite.

Paranol Fast Orange S—(NYANZA)—a direct orange suitable for rayon and cotton said to be very bright in shade and to be an excellent color for using in combination with other level dyeing direct colors. It is further said to give a pure white discharge with hydrosulfite.

Paranol Fast Yellow R L; Paranol Fast Yellow 4 G L—(NYANZA)—bright direct yellows for cotton and rayon. They are said to be exceptionally fast to light and to give pure white discharges with hydrosulfite.

Pharma Fast Blue Salt B—(CARBIC)—a new product of the Pharma Chemical Co., which gives bright Navy Blues on goods prepared with Naphtol A S, etc.

Pharma Fast Orange G Solution—(CARBIC)—an orange said to be of excellent fastness suitable for printing. It can be developed by ageing or steaming with or without acids.

Pharma Fast Scarlet Salt GG—(CARBIC)—a new product of the Pharma Chemical Co., which gives bright Scarlet shades said to be of excellent fastness on goods prepared with Naphtol A S, etc.

Pharmasol Blue G N S Solution — (CARBIC) — a new member of the Pharmasol series for printing. It gives shades slightly redder than the older types and of the same good fastness.

Polar Brilliant Blue R A W — (GEIGY)—this product, added to the range of Polar Colors, is said to possess extreme brilliancy and outstanding fastness to water, sea water, washing, milling, perspiration, stoving, carbonizing, decatising and excellent fastness to light. It is a neutral or weakly acid dyeing acid color which has been found unusually suited for raw stock, slubbing, carpet and knitting yarns. Because of its ability to stand chrome it can be used to good advantage for shading Erio Chrome Colors. For multi-fibered fabrics it finds good use because of its ability to leave adequately reserved the extraneous fibers.

Polar Violet B Conc. (P.A.F.) — (GEIGY)—the latest addition to the Polar series and range of neutral dyeing colors for wool or silk, said to possess marked fastness to wet finishing and weathering. This, like practically all Polars, can be used for shading Chrome Colors because of its resistance to Chrome. It finds good use on union goods, glorias and all types of multi-fibered goods involving animal fibers, because of its reserving, adequately, the extraneous fibers.

Ponsol* Blue B F Soluble Powder (Patented) — (DUPONT) — produces a reddish shade of blue on cotton and rayon. It is a solubilized vat type employed for printing and pigment-pad work, requiring no special aftertreatment or development. It is said to possess excellent level dyeing and penetration properties and fastness to washing, light and chlorine. It is well suited to use on shirting materials since it combines the best fastness with ease of application, it is claimed.

* Registered Trade Mark.

Ponsol* Blue G C L Paste (Patented) —(DUPONT)—is the newest anthraquinone vat color in the range of du Pont products. It is said to be of special interest for its attractive, bright, greenish blue shade on cotton and for its exceptional fastness to laundering with chlorine. It is said to possess very good fastness to most color-destroying influences commonly encountered, and can be applied to all forms of cotton and viscose process rayon in all types of dyeing machines. It is recommended by the manufacturers for printing.

Ponsol* Brilliant Red B Paste (P.A.F.) —(DUPONT)—This vat dyestuff produces bright, yellowish shades of red. It is suitable for application in the Franklin machine and by the padding method, exhibiting good dyeing properties. It is said to be very fast to chlorine, power laundering with chlorine and to show satisfactory resistance to soap. This product is recommended by the manufacturers for use as a self shade and in combinations to yield fast colors on cotton, rayon and linen in all forms.

* Registered Trade Mark.

Ponsol* Brown 2 G Paste—(DUPONT)—a vat color which produces yellowish shades of brown and which are said to be practically unaffected by the majority of ordinary destructive agencies. It is said to exhibit good dyeing properties, being applicable to cotton and rayon in all forms. It will be used for shirting, dress-goods and curtains because of its fastness and desirable shade which shows only a slight change under artificial light, it is claimed.

* Registered Trade Mark.

Ponsol* Golden Orange Y L Double Paste (P.A.F.) — (DUPONT) — is an anthraquinone vat color which produces yellowish shades of orange on cotton and viscose process rayon in all forms. It can be applied in all types of dyeing apparatus and is especially suited to pigment pad work. It is said to possess good resistance to light, chlorine, washing and power laundering with chlorine and changes only slightly in tone when given the usual soaping finish. For these reasons it is recommended by the manufacturers for coloring all types of fabrics which must withstand long wear and hard usage.

* Registered Trade Mark.

Pontacyl* Blue Black R C—(DUPONT)—is an acid black which dyes wool in all stages of manufacture. It is said to be especially useful for woolen piece-goods containing viscose process rayon effect threads since it leaves the rayon white. The color presents no application difficulties and possesses generally satisfactory fastness properties, it is claimed.

* Registered Trade Mark.

Pontamine* Diazo Yellow 4 G (P.A.F.) — (DUPONT) — a developed color which produces bright, greenish shades of yellow on cotton and viscose process rayon materials. It is said to possess good dyeing characteristics and to be sufficiently fast to perspiration and washing to be recommended for dyeing all types of dress-goods and similar materials. In medium and heavy shades, cotton and rayon are dyed about equally and it is also to be recommended as a ground for discharge patterns.

* Registered Trade Mark.

Pontamine* Fast Blue 3 G L—(DUPONT)—a direct color which dyes cotton and rayon in all forms to bright greenish shades of blue and may be applied to these fibers in all stages of manufacture. It is said to possess good working properties, to be very fast to light and fairly fast to washing, thus making it useful for curtain and upholstery materials. It is also employed for shading cotton in union goods and can be used as a ground color for discharge work.

* Registered Trade Mark.

Pontamine* Fast Blue 4 G L N—(DUPONT)—a direct color which is employed both as a dye and a ground shade for discharge printing on cotton, rayon and silk. It produces bright greenish shades of blue which are said to show good fastness to light and may be applied to loose cotton, yarns and pieces.

* Registered Trade Mark.

Pontamine* Fast Brown S K R L—(DUPONT)—a direct color. The bright, reddish browns produced by this color are said to possess good fastness to chlorine and satisfactory fastness to washing and light. The color is applicable to cotton, rayon, silk, hosiery and union materials both alone and in combinations.

* Registered Trade Mark.

Pontamine* Fast Turquoise 8 G L—(DUPONT)—is primarily of interest because it yields brilliant shades of blue comparable to those formerly obtained only with basic colors. The shades are said to be very much superior in fastness to light to those derived from basic colors. It may be applied to cotton, rayon, silk and wool as well as mixtures of these fibers.

* Registered Trade Mark.

Pyramine Orange R F—(GENERAL)—a direct color which is said to possess very good fastness to storing, acid and scroop. It will color cotton and rayon evenly and is also recommended for dyeing silk. The shades are easily dischargeable.

R

Rapidogen Bordeaux R N — (GENERAL)—is more soluble and develops very much quicker in acid steam than the old R brand. It produces on cotton and rayon heavy bordeaux prints said to be of good fastness to light and very good fastness to washing on and chlorine.

Rapidogen Brown I R R N—(GENERAL)—an improved brand of Rapidogen Brown I R R in so far as this new product is said to be very easily soluble and to develop very rapidly in acid steam.

Rapidogen Golden Yellow I F G—(GENERAL)—produces very desirable, bright shades which so far could not be printed with Rapidogen colors; the shades are said to possess excellent fastness to light and very good fastness to washing and chlorine; they exceed in this respect all other Rapidogen Yellows which are available. Aside from being very well suited for direct printing alongside Rapidogens and Algosols, the new product is also recommended by the manufacturers for colored resists under aniline black or Algosol colors.

Rapidogen Orange I G N — (GENERAL)—a new orange said to be of excellent fastness properties with a very bright shade. In contrast to the older Rapidogen Orange G, this brand will not change shade in prolonged washing; it is also said to be excellent to light and chlorine.

Rich Seal Colors—(ONYX)—water soluble pigment colors for printing. They are to eliminate need of ageing and steaming. It is stated that they have excellent washing and crocking fastness.

Rigan Sky Blues 2 G and 4 G (Patented)—(CIBA)—these new types augment the present series of Rigan Colors, which are offered to the trade for the purpose of dyeing level shades on viscose rayon of unequal affinity. The new types dye on viscose and Bemberg are suitable as self colors, or for the rayons, pure greenish toned blues which production of bright greens in combination with Direct Yellow 5 G conc. Cotton and viscose rayon combinations are said to be dyed uniformly in light shades and acetate rayon is reserved pure white, even in large effects.

Rosanthrene Orange 2 R(Patented)—(CIBA)—this product is said to give shades of considerably redder tone but of decidedly better fastness to light, when developed with either Beta Naphtol or Yellow Developer C. This new dyestuff is suited for dyeing cotton or rayon in all stages of manufacture. The dyeings are said to have a good fastness to washing, perspiration, alkalies, water and sulfuring. Viscose of unequal affinity is dyed in level shades. Acetate fibers are not reserved entirely. Mixed fabrics of cotton and viscose are said to be dyed 2 R. Silk may be dyed equally well from quite uniformly by Rosanthrene Orange a soap bath, a neutral bath or from a slightly acidulated bath. Wool-cut staple mixtures may be dyed with Rosanthrene Orange 2 R and Cloth Fast Oranges R and G, which produces equal toned dyeings. The dyeings of Rosanthrene Orange 2 R are said to be dischargeable to a pure white on cotton, rayon or silk.

Rotalin* Red B Extra Concentrated—(DUPONT)—for spirit printing. This color produces bluish shades of red and is used in the production of spirit printing inks as well as for coloring wood, leather, etc. It is said to possess good solubility in alcohol, to be faster to water and rubbing than comparable basic colors, and to show superior fastness to light.

* Registered Trade Mark.

S

Setacyl Direct Pink B Conc. — (GEIGY) — a recent addition to the Geigy line of colors for Acetate Rayon. It is slightly yellower in shade than Setacyl Direct Pink 3 B Conc., is said to disperse very well, dye level and to be dischargeable. This is what might be termed a "pile-up type"—one which has good affinity for the yarn whether

lustrous or delustered, which permits not only its use as a Pink but also as a Red. This product is unique in its dischargeability.

Seto **Brilliant Blue G**—(GEIGY)—while primarily designed for the Lake industry, its rich greenish blue tone makes it interesting to the pure silk dyer. Neutral or weakly acid dyeing is preferred.

Silk Discharge Black G B—(CIBA)—a new product designed especially for the dyeing of dischargeable black grounds on natural silk. It can be dyed on weighted or unweighted silk from a neutral salt, weakly acidified (acetic or formic) or neutral soap bath.

S R A Black D Y—(CELANESE AND A. A. P.)—a non-subliming, quick dyeing developed black for Celanese rayon which produces greenish shades said to be of excellent fastness. It is suitable for jig or box work and offers particular advantages where fabrics containing pigmented yarn are concerned.

S R A Black J—(CELANESE AND A. A. P.)—a readily soluble, quick dyeing, non-subliming developed black, for Celanese rayon which affords superior penetration and produces rich, jet shades said to be of excellent fastness. This product is particularly recommended by the manufacturers for jig work.

S R A Red V I I I—(CELANESE AND A. A. P.)—a readily soluble, bright, yellowish red for Celanese rayon which dyes quickly and levels well even at low temperatures and produces shades said to be of very good to excellent fastness. The color is dischargeable and also suitable for application printing.

S R A Rubine I X—(CELANESE AND A. A. P.)—a readily soluble, low temperature, quick dyeing color particularly useful as a base for wine shades on Celanese rayon. It yields dyeing said to be of very good to excellent fastness and can be used for discharge work.

S R A Scarlet I I I—(CELANESE AND A. A. P.)—a quick-dyeing color for Celanese rayon which exhausts and levels well even at low temperatures and affords shades said to be of very good to excellent fastness. The color can be used for either direct or discharge printing.

S R A Violet Blue F S I—(CELANESE AND A. A. P.)—a reddish blue said to possess excellent fastness properties of special interest for Celanese rayon drapery fabrics.

S R A Yellow G—(CELANESE AND A. A. P.)—a greenish yellow which produces shades said to be of very good fastness and to be useful in the production of bright greens on Celanese rayon, particularly in combination with S R A Green Blue I I. It is dischargeable.

Sulfanthrene* Scarlet 2 B N Paste (P. A. F.)—(DUPONT)—a vat color which is primarily of interest for printing delustered rayon. It can also be used on bright rayon, cotton and acetate where bluish shades of scarlet are desired. Like the other N types of vat printing colors, this product possesses good brilliancy and strength which are not affected by long use and repeated washings.

* Registered Trade Mark.

Sulfogene* Bordeaux 2 R N Concentrated — (DUPONT) — is the brightest sulfur bordeaux in the du Pont line, said to possess good fastness toward washing and perspiration. It can be applied as a self color but is more generally employed in combinations as a reddening and brightening element and should be widely used for this purpose.

* Registered Trade Mark.

Sulfogene* Direct Blue 2 R C F (P. A. F.)—(DUPONT)—a sulfur color which produces bright, reddish shades of navy blue which are said to show good resistance to washing and satisfactory fastness to light and perspiration. It is a direct dyeing and non-bronzing blue which presents no application problems, being well suited to dyeing pieces in the jig. Combining practical shade with good general fastness it will be used alone or as a base for navy blues on materials which must withstand hard wear, such as overalls, ducks and drills.

* Registered Trade Mark.

Sulfur Brown R C F—(NATIONAL)—a new sulfur brown of reddish shade with a low copper content; particularly suitable for coloring goods that subsequently are to be rubberized. Possessing very good fastness to cross dyeing, it is therefore well suited for coloring warps for various union fabrics that are later to be cross dyed, it is claimed.

Supra Light Yellow G G L—(GENERAL)—said to possess very good fastness to light and to be not only of interest for direct printing but of particular interest for colored discharge work. Its fastness to light and fastness to washing makes it very desirable in cases where the Chinoline Yellows have not been satisfactory, it is said.

Supramine Pure Blue G L—(GENERAL)—dyed from a weakly acid bath, it produces on wool, bright greenish blues said to be of good fastness to light, water, salt-water, washing and perspiration and is therefore of special interest to the knitting trade. Supramine Pure Blue G L also stands a medium fulling and is said to be of very good fastness to carbonizing and decatizing: chroming turns the shade slightly duller. It exhausts well also from a neutral bath and may be used in union dyeing: it has good affinity for pure and tin-weighted silk.

Supramine Red B L L—(GENERAL)—a new addition to the Supramine series, distinguished by an improvement in fastness to light over the older brands. It dyes level from an acetic acid bath and produces bright reds said to be of very good fastness to water, washing, salt-water and perspiration; it is of special interest to the knitting trade. Effects of cotton, rayon and acetate are said to be left perfectly clean. Supramine Red B L L is also recommended by the manufacturers for dyeing of wool and fur hats, especially in the half milled state, as it stands the usual finishing process very well. It gives a clear white discharge with Rongalite C.

V

Vat Printing Black G L, Micro Powder and Micro Paste—(CIBA)—this type furnishes a deep black print said to be of very good fastness to light, washing and chlorine. The strength of the paste equals that of the powder. It is claimed that this new product has an advantage over the present vat printing blacks on the market in that it may be printed without any special process; it re-oxidizes quickly after ageing, so there is no danger of bleeding during washing. For cotton and rayon printing it is applied according to the usual methods.

X

Xylene Milling Yellow 3 G L (Patent Applied For)—(SANDOZ)—a new acid milling color purer in shade and yellower than Sulfonine Yellow P G, but is, however, appreciably redder than Xylene Milling Yellow 6 G. It is said to be characterized by good fastness to washing and sea water in addition to good fastness to light, and in contrast to other milling yellows, to be non-phototropic. It is said to be suitable for the dyeing of loose wool, slubbing and shoddy and especially of yarn required to be dyed fast to sea water. On account of good fastness to milling (neutral) and stoving the color is also said to be of considerable service for the woolen blanket trade. Other uses for which the manufacturers recommend this color include the dyeing of military pipings, fast shades on piece goods, dyeing of natural silk and hosiery goods. Cotton, viscose and acetate rayon effect threads are well reserved.

TEXTILE CHEMICALS

A

Aero-Dri — (CYANAMID) — a new one-bath water repellent recommended by the manufacturers for all types of textiles including cotton, wool, silk, linen and rayon. Aero-Dri is said to be a very stable creamy white emulsion. It is further said to emulsify very readily with warm water, to be easy to apply and the aqueous emulsion to be very effective water repellent effects are said to be obtained without the necessity for special equipment or special procedure.

Akaustan N—(GENERAL)—materials treated with Akaustan N, are said to regain their natural handle. Usually a concentration of ¾-1½ lbs. of Akaustan N per gal. of water is sufficient. The treatment is best carried out in a cold or lukewarm bath and fried below 120°F.

Albasol No. 1—(NOPCO)—a blended composition which may be employed alone as a filling treatment on rayon crepe yarns and said to be capable of producing fabrics with a heavy uniform pebble.

Alco Dexatol—(ALCO)—for degumming pure thread silk, cotton, silk and rayon, hosiery. This product is an especially prepared oil, in which are incorporated several aliphatic sulfonates, to give the desired feel to the goods. It is stated that complete degumming is accomplished, with a smaller percentage of Alco Dexatol working equally as well in the one or two bath method. It is said that it can be used to great advantage, on silk and silk hosiery, containing a large percentage of mineral oil and foreign matter.

Aminosol—(WARWICK)—a cat-ion active softener of semi-permanent character which is applicable to all types of fibers. It is said to produce a soft, suede-like finish in extremely low concentrations at low cost. It is further said to improve the elasticity of knitted fabrics and will not affect colors or whites. It can be applied on any regular finishing equipment. It is particularly recommended by the manufacturers for pile, knitted and all types of silk or synthetic fabrics.

Anti-Fume Finish — (SANDOZ) — a finish for acetate rayon fabrics which is said to increase the resistance of acetate rayon dyes to gas fumes. It is further said to impart to the goods a desirable soft handle which in most cases renders the use of any other finishes unnecessary.

Antimucine S R—(SANDOZ)—a mildew-proofing agent suitable for use with water-repellent compounds. It does not impair water-repellency and as it is non-volatile the antiseptic effect is said to be very durable.

Appretan W L—(GENERAL)—said to produce a filling of rayon fabrics or mixtures of cotton and rayon without producing a harsh handle. It is said to be easily soluble in water and neutral in reaction. Appretan W L is applied only in cold liquors. It may be used with softening agents such as Soromine W L. It is particularly suited for finishing linings of rayon or rayon and cotton.

Aqua Perm No. 100—(AQUA)—a permanent finish; a complex organic compound for application to cellulose fibers, said to be absolutely permanent in its effect. This material is ion active and may be applied substantively, either in the dye bath or as a finish.

Aqua-Perm F—(AQUA)—a permanent finish; a specially treated synthetic resin for application to warp sized and other heavily sized cottons, wherein a high degree of sizing is obtainable at a low curing temperature.

Aqua-Perm H. H.—(AQUA)—a permanent finish; a combination of synthetic resins specially adapted for hosiery finish. These are water emulsions requiring low curing temperatures and any degree of dullness, fullness and weight may be obtained, it is claimed. The resultant finish is said to be permanent to laundering.

Aqua-Perm S. F.—(AQUA)—a permanent finish; a synthetic type resin for application to cotton and spun rayon fabrics; a water soluble solution of a resin which is rendered insoluble on curing. It is stated that with the use of this compound slipping and shrinkage are minimized and a wide range of handle may be obtained.

Aqua-Seal C—(AQUA)—a permanent finish; a synthetic resin for specific application on low count rayon fabrics to impart resistance to fraying and slipping. These properties are said to be obtained without affecting the feel or appearance of the fabrics.

Aqua-Sec No. 82—(AQUA)—a type of Aqua-Sec water repellent specifically developed for application to spun rayon type fabrics, wherein an exceptionally full firm hand is said to be obtained and where required, the hand can be extremely scroopy such as is desired on knitted fabrics.

Aqua-Sec No. 104—(AQUA)—a type of Aqua-Sec water repellent specifically adapted for cotton finishes. It may be incorporated with specific starches and other weighting compounds, and is said to be extremely stable even at high temperatures.

Aqua-Sec No. 263C—(AQUA)—a one bath water repellent combination developed for application to lustrous silks, satins and taffetas. It is claimed that this finish will not affect the luster in any way, at the same time imparting a full soft hand without danger of mark off.

Aqua-Sec No. 900 Range—(AQUA)—a type of water repellent compound developed for hosiery finishing wherein the degree of luster, softness and body may be obtained with high splash proof qualities. It is stated that a high degree of permanence to laundering is obtainable with one of the compounds.

Arko Finishes—(ARKANSAS)—a recently developed combination of products that are intended for use in one bath for finishing hosiery to produce an improved lower luster, spot-proof finish. Simplicity of use and greater control of the finish, no matter what the gauge or construction of the hosiery, is claimed as well as improvement of the snag and run resistance of the hose. A better general appearance is noted with sleaziness and unevenness of finish eliminated, it is said.

Aromol—(BURKART)—synthetic detergent and wetting agent. It is said to be effective in hard water, and in acid or alkaline baths, absolutely neutral in reaction, and may be safely applied to any textile fiber or fabric. It is available in either flake or solution form.

A T W Finish—(BURKART)—finishing agent for woolen or cotton piece goods, or mixtures. It may be used alone or in combination with starches, weighting agents, etc. It acts as an effective binder and plasticizing agent.

B

Bozetol — (HART) — a derivative of ricinoleic acid said to possess exceptional wetting out properties, especially in the cold.

C

Calco Developer B O N —D—(CALCO)—with the addition of this new type of dispersed B O N, Calco offers a complete line of developers to suit the requirements of every customer. Calco Developer B O N is the straight Beta Oxy Naphthoic Acid. Calco Developer B O N S is a completely water soluble standard. Calco Developer B O N —D is the dispersed type.

Calco Sulfoxylate F S—(CALCO)—a sulfoxylate which is available in either egg size or rice size.

C C C C Flameproofing Compound—(COMMONWEALTH) — for flameproofing textile fabrics.

CerePurge No. 2—(DETERGENT)—a product intended for use in degumming silk to get a complete removal of throwsters lubricants and to remove all or any desired part of the natural waxes on silk. It is said to have a **bland** but adequate alkalinity built to do the required work without damage to the fiber. It is further said to rinse easily and completely and to give the finished fabric a desirable appearance and hand.

Comco Duller — (COMMONWEALTH)—a dull finish in powder form for hosiery.

Comco Filler D — (COMMONWEALTH)—a product for the hosiery trade, combining filling and dulling properties.

Comco Stain Remover—(COMMONWEALTH)—a powerful stain remover said to be especially suitable for hosiery.

Comcotex H—(COMMONWEALTH)—a hosiery finish said to possess penetrating power.

Creatasoap — (CREATIVE) — a recently developed grease and oil solvent, which is furnished in a highly concentrated liquid form, whereby solutions may be made, it is claimed, with from one part Creatasoap in ten parts water to one part in twenty parts water and very efficient grease and oil dispersing medium produced, for removing all grease and oil accumulations from objects, automotive and other mechanical parts and machinery, walls, floors, etc. Creatasoap is a clear, clean product and, it is said, will not fire, is fumeless and odorless, non-caustic and safe as water to handle, will not injure the flesh, and may be used as a mechanics liquid hand soap either pure or in solutions.

D

Degomma 80 A—(ROHM)—this is a new and greatly improved enzyme for use in desizing textile fabrics. Its high strength, high uniformity, and high resistance to varying conditions of acidity and alkalinity, are said to give it unusual value for textile processes.

Diastine—(COMMONWEALTH)—a desizing agent in paste form which works best at the boil.

Diethylaminoethanol—(CARBIDE)—$[(C_2H_5)_2N(CH_2CH_2OH)]$ basic in character, diethylaminoethanol readily forms fatty acid derivatives which are said to be excellent emulsifying agents in acid mediums. Of potential interest are the textile softeners made from its soaps. It readily furnishes salts which can be dissolved in water. Being in the family of alkylolamines, it combines the valuable properties of amines and alcohols. Like ethanol, it can be reacted through the hydroxyl group to yield a series of derivatives which differ in that the resulting compounds contain a tertiary amine group. It is stated that diethylaminoethanol is a colorless, very hygroscopic liquid which boils at 162.2°C. and is completely soluble in water or alcohol.

Dispersol—(LAUREL)—a liquid product made from organic solvents used as a dispersing agent for dyestuffs and as a leveler in dyeing. It is said to be especially valuable for use on cotton piece goods and other type fabrics.

D-Scour — (BURKART) — concentrated and powerful scouring agent. It is composed of low titer soaps, solvents, and well-buffered alkalis. It is said to be well suited for boiling off extremely dirty cotton or cotton and rayon hosiery. Rapid wetting and solvent properties are said to combine to produce remarkable cleansing results on oily gores and other troublesome areas.

Dowicide A—(CIBA)—sodium orthophenylate. It is a cream colored flake, having a slight but not unpleasant odor. It is claimed to be extremely soluble in water. It is said to possess good properties both as a germicide and fungicide, although its action is greater in a germicidal sense. For the protection of cloth, either sized or unsized, against mold or mildew, a concentration of 1 per cent on the dry weight of the cloth should be retained on it.

Dowicide B — (CIBA) — sodium 2-4-5 trichlorphenate. In appearance it is a white to tan flake. It is said to be readily soluble in water and possesses a slight phenolic odor. It is said to possess very strong fungicidal properties but is not particularly strong as a germicide although it has some activity in this regard. It has a rather high vapor pressure and consequently is not generally recommended for mold or mildew proofing of textiles.

Dowicide C—(CIBA)—sodium 2 chlororthophenylphenate. It is in the form of crystalline solid lumps which are soluble in water. The material has a slight odor. It is said to possess good all around germicidal and fungicidal properties. It and its corresponding phenol form, Dowicide 3, are the best Dowicides for combination effects.

Dowicide G—(CIBA)—sodium pentachlorphenate. It is a yellowish tan flake and is said to be readily soluble in water. It is principally a fungicide and it is said to have been found of excellent value in the preservation against mold and mildew of sizing and finishing materials.

Dowicide 1 — (CIBA) — orthophenylphenol. It possesses a slight odor and is in the form of a white flake. It is the corresponding phenol form of Dowicide A and possesses practically the same properties fungicidally and germicidally. It is said to be soluble in oils and organic solvents and may be dispersed in water by the use of an appropriate emulsifier like sulfonated castor oil.

Dowicide 2—(CIBA)—2-4-5 trichlorphenol. Practically the same statements apply to this as to Dowicide 1. It is the corresponding phenol type to Dowicide B.

Dowicide 3 — (CIBA) — 2 chlororthophenylphenol. It is the corresponding phenol type of Dowicide C and the statements under Dowicide 1 also apply here.

Dowicide 7—(CIBA)—sodium pentachlorphenol, the corresponding phenol type of Dowicide G. It is soluble in oils and organic solvents but not as readily as the other types. It is said that it may be dissolved easily by using an intermediate solvent such as alcohol or pine oil to obtain solution and then diluting to required volume with a cheaper solvent.

Dullatone M M—(ONYX)—a duller for hosiery. It precipitates into the fibers, eliminating chalkiness and giving appearance of high twist.

Duponol* Special W A Paste (Patented) — (DUPONT) — a fatty alcohol sulfate, which is both a detergent and a wetting agent. It is said to dissolve readily in cold water to form stable solutions over a wide range of concentrations. It is stated that it does not separate on cooling, nor is it precipitated by calcium chloride and is, therefore, effective in hard water as well as soft. It is claimed to be one of the most efficient agents on the market when used to give re-wettability to fabrics and it has the advantage of a mild, pleasant odor not found in similar competitive products.

*Registered Trade Mark.

F

"Fanco" Aquapel C K M—(FANCO)—a new type water repellent hosiery finish said to be of unusual stability and to impart not only a greater degree of repellency and snag-proof properties, but also excellent boarding properties and to produce good lengths.

"Fanco" D-138 Sanforizing Oil—(FANCO)—this is said to give the right degree of penetration and to impart an unusually soft hand and feel to the fabric.

"Fanco" Lusterene Finish D—(FANCO)—this product is said to be exceptionally beneficial in treating goods which are to be calendered. It is used in a spray or atomizer and claimed to disperse into such minute particles that the nozzles of the atomizer will not become clogged. When this is sprayed on the face of the fabric a higher degree of luster is obtained.

"Fanco" Prosol Finish—(FANCO)—said to be an exceptionally efficient product for producing a non-scratch finish and to impart body without a leathery harsh feel.

Fiba Weld C—(ONYX)—a slip-proof finish to seal fibers against slippage.

Flameproof Compound No. 400 — (LAUREL)—a pasty white product applied to all type fabrics, especially for automobile, airplane, and furniture covering and drapery material. This product is said to have a very definite action and is easily applied.

Flexol Plasticizer 3GO—(CARBIDE) [$(C_7H_{15}COO):C_2H_4(C_2H_4O)_3$] introduced recently as a softening agent for natural and synthetic resins, including the "Vinylite" brand of resins, "Flexol" plasticizer 3 G O is said to have many advantages not found in other products. It increases the elasticity of the plasticized product without unduly reducing the ultimate strength. It has a boiling point of 215°C. at 5 mm. and a very low water solubility. Its vapor pressure is lower than that of dibutyl phthalate. It is said to possess a great resistance to discoloration under the influence of ultraviolet light. In addition, it is said to have the extraordinary property of increasing the flexibility of nitrocellulose films when the temperature is lowered in the range of 30°C. to 0°C.

G

Gardinol* Special W A Paste (Patented)—(DUPONT)—a fatty alcohol sulfate, which is both a detergent and a wetting agent. It is said to dissolve readily in cold water to form stable solutions, over a wide range of concentrations. It is stated that it does not separate even at very low temperatures, nor is it precipitated by calcium chloride and is, therefore, effective in hard water as well as soft. It is claimed to be the most efficient agent on the market when used to give re-wettability to fabrics and to have the advantage of a mild, pleasant odor not found in similar competitive products.

*Registered Trade Mark.

Glycol Diacetate — (CARBIDE) — [$CH_3COOC_2H_4OOCCH_3$] — glycol diacetate, a new ester solvent, dissolves both cellulose nitrate and acetate, as well as the cellulose ethers. It is a water-white liquid which boils at 186°C. and has a xylene dilution ratio of 1.4. In its properties, it is similar to triacetin. It is said to be an excellent solvent for printing inks and lacquers and to be quite stable in the absence of water. It is said to—prevent blushing in airplane dopes, impart suppleness to cellulose ether films, and to be an excellent resin solvent. It shows promise as a non-discoloring plasticizer for ethyl and benzyl cellulose, as a perfume fixative, and as a component of a solvent mixture for the refining of lubricating oils and for the removal of free fatty acids from oils and fats.

H

Hartex Oil R T 314—(HART)—a soluble oil containing no moisture nor free fatty acids. It is recommended by the manufacturers as an inexpensive finishing oil.

Hygrolit N E V—(HYGROLIT)—special for Jack Spool conditioning with mildew preventive properties.

Hygrolit N H A—(HYGROLIT)—for twist setting and conditioning of spun rayon and cotton.

Hygrolit P W—(HYGROLIT)—for conditioning of waxed wool yarn on cones.

Hygrolit W O A—(HYGROLIT)—for twist setting and conditioning of woolen and worsted yarn.

I

Igepal C — (GENERAL) — is recommended by the manufacturers for the scouring and processing of cellulose fibers. The outstanding properties of the product, apart from its superior cleansing or detergent powers are claimed to excellent wetting-out, resistant to hard water and metallic salts encountered in textile processing, prevents lime soap, not hydrolized by water and easily rinsed out of fabrics.

Igepal L—(GENERAL)—a new synthetic scouring agent for the processing of all kinds of fabrics. It is said to be easily soluble in water and to possess excellent properties of wetting-out and lime soap prevention and to be a good washing agent for all types of impurities.

Igepal W—(GENERAL)—a new synthetic scouring agent for the processing of wool and mixed fibers containing wool.

Intramine (Patented) — (SYNTHETIC)—a modern product of the newest type of wetting, penetrating and detergent agents which is said to be active in acid, neutral and alkaline solutions. It is claimed that its powerful detergent qualities are especially apparent under conditions where hard water, low temperatures, sensitive materials, acid, grease and lime have to be dealt with. A variation of types of the Base Intramine have been developed for special use in scouring, washing, dyeing, printing, etc.

Irgamine L—(GEIGY)—said to be a meritorious, excellent product designed to give better handle to synthetic fibers or combination fibers involving a good

portion of synthetic fibers. It has simple application. Vegetable fibers are said to be improved considerably in feel with the use of Irgamine L.

Isopropanolamines — (CARBIDE) — $[(CH_3CHOHCH_2)_xN]$ — a mixture of mono-, di- and triisopropanolamine that is liquid at room temperatures has been found to form stable, non-darkening soaps that are excellent emulsifying agents, it is claimed. These soaps are said to be completely soluble in hydrocarbons, such as mineral oil, naphtha, and gasoline, even at concentrations below 2 per cent. Since the isopropanolamine soaps are so resistant to darkening, they may also be used to advantage in preparations of cosmetics that remain colorless indefinitely. This better hydrocarbon solubility and color stability is said to make them of special interest in dry cleaning soaps and soluble oils.

K

Kem Liquid Glue No. 344—(KEM)—a concentrated liquid glue; gelatin-type glue in liquid form, light color, mild odor; made from animal stock only; for textile sizing and finishing purposes, said to replace fish glues, and said to offer a very convenient and economical form of replacement of dry animal glues and gelatins; a pale amber color and syrup consistency.

L

Lanasan F B—(SANDOZ)—a wool protecting agent which is said to counteract the shrinking, felting and hardening of the fibre by alkalies. It is used in scouring, stripping, vat dyeing and with alkaline treatments generally. It does not affect the dyeing qualities of the fiber.

Lanitol — (ARKANSAS) — an intensive wetting and penetrating agent, said to possess powerful scouring and detergent properties. It is said to be effective in a neutral, alkaline or acid bath and to be resistant to hard water and metallic salts. It is said to improve the efficiency and definitely reduce the cost of all boil off and scouring baths. It may be used alone or in conjunction with alkali or as a partial substitute for soap, on piece goods, raw stock or hosiery. It may be used in all dyeing operations and with every type of dyestuff to improve the pentration of the color and produce a level shade, it is claimed. It is said to be a valuable agent for processing and dyeing hosiery, particularly mixed fiber combinations. Hose containing a dyed acetate stripe may be processed with Lanitol without the color bleeding on to white acetate or other fibers that may be present, it is stated.

Lewtex — (HART) — a one - piece weighter and softener, particularly recommended by the manufacturers for napped goods.

Linen Finish S—(SANDOZ)—a finish for spun rayon fabrics to which it gives a crisp, springy hand. At the same time it is said to act as a slip-proofing agent, preventing the shifting of the fabric under tension.

Lyofix D E—(CIBA)—a new textile auxiliary of the Sapamine KW class. This new product is recommended by the manufacturers particularly for the after-treatment of direct dyeings to increase their fastness to water. Direct dyeings, after-treated at 85-95° F. for ½-hour with 1-4 per cent of Lyofix DE, are said to be considerably improved in their resistance to water.

M

Mapromin 66 Paste—(ONYX)—for dyeing of Rayon hosiery. It is said to insure level dyeing. Free of storage odors.

Medialan A, A Pdr., A L—(GENERAL)—Medialan A and A L are in paste form whilst Medialan A Pdr., as designated, is supplied in powder form. The Medialans, in comparison to soap, are said to have better resistance to hard water, low sensitivity to acids, excellent milling effect, do not split hydrolytically in aqueous solutions, thereby enabling neutral scouring, and are very easily washed out.

Migafar P—(CIBA)—a new finishing material which is recommended by the manufacturers for the following purposes:

1. Piece goods dyeing.
   (a) For the removal of chafe marks on silk or rayon.
   (b) For avivage, for the production of a fresh, bloomy color tone.
   (c) For levelling out unequal delustering effects.
2. Yarn dyeing.
   As an avivage and for the production of a good scroop.
3. Garment dyeing.
   As an avivage or brightener for silk, rayon, cotton or even woolen garments.

Modinal* T Paste (Patented); Modinal* T Powder (Patented) — (DUPONT)—fatty alcohol sulfate products which are particularly recommended by the manufacturers for scouring because of their excellent detergency. They possess similar working properties but differ in their physical states. They are said to dissolve readily in hot or cold water to form heavy-bodied soap-like solutions and do not fall out of solution on cooling. These products are, therefore, useful where stock solutions, standing baths, and continuous operations are used. Textile processors will find them especially suited to removal of solid soil and loose dyestuff particles, producing brighter fabrics as a result, it is claimed.

*Registered Trade Mark.

Modinal T—(PROCTER)—a detergent for use in scouring, wetting out, dyeing assistant and emulsifying purposes. It is available in both paste and powder form. The chemical composition is sodium sulfate of technical oleyl alcohol.

N

Naphthalene Sulphonic Acid Ester Powder—(ONYX)—a dispersive, penetrating and wetting out agent.

Naphthol A S S W Dispersible—(NATIONAL)—a new addition of a highly substantive type that disperses rapidly and is a distinctive improvement on Naphthol A S S W.

Niaproof*—(NIACET)—a new aluminum salt for water repellent treatment specially developed for the modern concentrated water repellent preparations. "Niaproof" contains 37 to 39 per cent active aluminum oxide. It is readily soluble in water giving solutions of 5.1 to 5.4 pH depending on concentration, which can be reduced if desired to a pH range of 3 to 4 by the addition of Glacial Acetic Acid. "Niaproof" B is a more basic type of aluminum acetate salt containing 35 per cent active aluminum oxide. Solutions have a pH range of 4.7 to 4.8 which can also be lowered by the addition of Acetic Acid. The use of either "Niaproof" or "Niaproof B" instead of the usual aluminum acetate solutions is said to assist in the preparation of more water repellent and more concentrated proofing materials for all types of textile goods.

*Registered Trade Mark.

Nopco 1856 C—(NOPCO)—a .new sulfonated softener produced by a new process said to give maximum softness and plasticity to finished cotton fabrics.

Nopco 2105 B—(NOPCO)—a new synthetic product for imparting softer finishes to rayon and acetate fabrics. A fraction of a percent is sufficient to produce a pleasing, soft hand, it is claimed.

Nopco 2105 C—(NOPCO)—a synthetic product designed to impart to rayon and cotton fabrics, as well as knit goods, an exceptional soft and slick hand. It is two or three times more effective than regular sulfonated tallows, it is claimed.

Nopco 2114 E—(NOPCO)—an emulsifiable worsted lubricant which is said to be a safe, uniform simple product of the chemical laboratory for the making of high quality tops.

Nopco 2146 C—(NOPCO)—a non-slip finish for rayon fabrics, which is said to be easy to apply on standard equipment without additional processing.

Nopco 2189—(NOPCO)—a glycerine substitute usable primarily as a plasticizing and light weighting material. It is said to possess the unique property of surpassing glycerine as a plasticizer of protein mixtures.

O

Ondal* A (Patented)—(DUPONT)—a textile assistant which is used both as a scouring and an oxidizing agent in the developing of vat colors. It is said to be quite stable, releasing its oxygen at a constant rate, and to be easy to apply, thus assuring satisfactory and uniform results. The greatest advantages offered by the use of "Ondal" A are a decrease in the number of operations and length of finishing time required and the assurance of easily duplicated shades, it is claimed.

*Registered Trade Mark.

Onyxsan—(ONYX)—a cation-active compound said to yield maximum, permanent softness to all cellulosic fibers. Softness is claimed to be permanent to dry-cleaning and laundering.

P

Paramine R S — (ARKANSAS) — claimed to be a very powerful softener and offered for use in all finishing baths to produce greater softness and generally improved finish. It is stated that its greater efficiency as a finishing agent reduces costs and permits the production of a soft full feeling hand and finish that has heretofore been impossible to obtain on certain fabrics. It is said to be particularly useful for finishing silk, cotton, viscose and acetate rayon fabrics, as well as all fine materials. It is said that it also produces a highly desirable, full wool-like finish on spun rayon fabrics.

Penetrant M-7—(BURKART)—combination of synthetic detergent and solvent, said to be an ultra fast wetting oil. It is said to be effective in hard water or in acid or alkaline baths. It is said to be particularly suitable for one-bath scouring and dyeing, as solvent properties make this product a desirable boil-off aid.

Peregal O—(GENERAL)—said to be extremely useful both as a levelling assistant and a stripping agent for Vat dyestuffs on both yarn and on piece-goods. It is furthermore said to be very valuable as a dyeing assistant for direct and basic dyestuffs.

Perlof Finish H — (SANDOZ) — a water-repellent hosiery finish said to impart to the hose a full, soft finish.

PermaPar—(REFINED)—this is a cat-ion, substantive compound which is said to render all cellulosic fibers permanently soft to washing and drycleaning. It is a pure white product and does not stain white fabrics. It is claimed that it is of unusually high concentration and as a result finishing costs are reduced below those of other compounds used before. Goods have a cleaner look and colors are brightened making them much more attractive to the ultimate consumer, it is claimed. No changes are required in equipment and PermaPar can be applied in the mangle, quetsch, dyebox or print-washer. Some mills have found it advantageous to apply PermaPar after bleaching or scouring, dyeing or printing, this new departure having many very interesting possibilities, it is claimed.

Permolite — (ARKANSAS) — offered for finishing rayon fabrics to prevent slippage of the filling yarn. It is said to be particularly useful for finishing light, low count fabrics, as besides preventing the shifting of the yarn in the cloth, it also bodies it up and produces a firmer and smoother finish, which is equal to a higher count or better grade fabric.

Phenyl Cellosolve — (CARBIDE) — $[C_6H_5OC_2H_4OH]$ Phenyl "Cellosolve," a new "Cellosolve" derivative in the high boiling range, combines the desirable properties of the ether-alcohols with the aromatic ring. It is a water-white liquid with a faint aromatic odor and boils at 245.2°C. Since it is partially soluble in water and contains both the ethanol and phenyl groups, it is stated that it will dissolve nitrocellulose, cellulose acetate, ethyl cellulose, and that it is a good solvent for various types of oils, commercial resins, and a host of diverse materials.

Being almost odorless, it is effective as a fixative for delicate perfumes in soaps and cosmetics, where its high alcohol solubility is an advantage. It is said to be stable in the presence of acids and alkalies, remain colorless, and not to become rancid. Because of its mild odor and excellent resin and oil solvent properties phenyl "Cellosolve" is said to be suitable as a plasticizer in lacquers and coating compositions for paper, leather, and cloth. Its alcohol group and benzene ring make it a potential intermediate for the synthesis of plasticizers, germicides, and pharmaceuticals.

Phenyl Diethanolamine—(CARBIDE) —$[C_6H_5N\ (CH_2CH_2OH)_2]$ useful dyestuffs can be obtained by condensing phenyl diethanolamine with aromatic aldehydes, such as 2-chlorbenzaldehyde, or by substituting it for dimethyl aniline in the preparation of triphenyl methane dyes. On fusion with alkalies, phenyl diethanolamine yields indoxyl, which is used in the synthesis of dyes of the indigo type. Since it undergoes the characteristic reactions of tertiary amines, this most interesting dyestuff intermediate has other uses which are being investigated. Phenyl diethanolamine is a white, crystalline solid which melts between 56°C. and 58°C.

Pro-So-Tex No. 37—(QUAKER)—a water white, soluble white mineral oil that is said to be entirely odorless and non-oxidizing. It is said to be particularly useful as a softener in the last rinse on dyed cotton. Its presence in finishing solutions in conjunction with sulfonated tallows or sulfonated oils is said to prevent their separation or scumming of the solution. It is also advantageous for use as a stainless shear oil.

It is said to be completely emulsifiable in ordinary water making very stable emulsions and will scour freely from the stock whenever desired, it is claimed.

Pro-So-Tex No. 53—(QUAKER)—a highly sulfonated oil that, it is claimed, will stand the presence of high concentrations of salts or acids without separation. It is said to be particularly suitable as a softener for cotton, wool, rayon and real silk piece goods. It is

usually applied in the dye bath because its penetrating and dye leveling properties aid even dyeing, it is claimed.

It gives a full, soft hand and will not alter shades or undergo oxidation in the goods, it is said.

Pro-So-Tex No. 56—(QUAKER)—a specially prepared blend of a substituted aromatic sodium sulfonate and special sulfonated oil intended for use as a combination scouring and softening agent for all printed fabric. It is said to thoroughly clean print goods but removal of base color is much less than when scouring with sulfonated fatty alcohol compound or soap. Print goods are said to be left properly softened for final finishing, eliminating the usual separate softening treatment.

It does not discolor white, affect other colors or cause odor in the goods, it is claimed. It is prepared as a readily soluble, clear oil.

Pro-So-Tex No. 59—(QUAKER)—an odorless, pure white paste softener, prepared from sulfonated amino base combined with stearic acid. It is said to be very suitable for softening white bleached or colored flannels, knitting and weaving yarn and fine print goods. It is further said to promote easy napping of flannels and impart a softness and handle superior to that obtained with regular stearic softeners or sulfonated fatty alcohols.

It is highly stable in solution and if applied in starch mangle will not build up on the rolls or cause spotting and may be boiled in any proportion with water without separating, it is claimed.

Pro-So-Tex No. 60—(QUAKER)—a one-bath waterproofing agent, used to produce a water repellent finish on textiles of all types. It is supplied as a cream colored, viscous liquid that mixes readily with cold water in all proportions. It is stated that it may be applied at high temperatures that would cause emulsions of ordinary products to split out. It is claimed that it has unusual fastness to laundering, much better than the usual aluminum salt type water-proofer. The finish is said to be resistant to dry cleaning solvents. Lesser amounts of this material may be used to obtain satisfactory results at low cost of application, it is claimed.

Pro-So-Tex No. 75—(QUAKER)—a general scouring and softening agent said to be highly stable in the presence of acid, salt, lime, etc. It is said to give results equally effective to those obtained with sulfonated fatty alcohol and to be much lower in cost to use. No discoloration is obtained when using this product, it is said. It is supplied as a light, flocculent powder, quickly soluble in water.

Pro-So-Tex No. 1550—(QUAKER)—a sanforizing penetrant and softener, designed to give unusual softness, combined with rapid penetration and wetting out. It is said to be a claret colored liquid, soluble in water in all proportions and containing no oxidizable oils or other ingredients apt to cause odor in the goods. It is stated that it cannot affect the felts in the sanforizers. Less of this product can be used than of ordinary oil because it has a high fat content and a very low percentage of moisture, it is claimed.

R

Rapidogen Printing Gum — (ONYX) —excellent penetration on Rapidogen, Pharmasol and Indigosol colors is claimed, as well as good, clear, sharp prints. Washes out readily.

Rayon Size No. 375—(LAUREL)—a specially prepared product for use on rayon warps. It is said to be very soluble, easily applied, and to leave the warp in proper condition for good weaving. It may be removed in the regular scouring process.

Repelon—(HART)—a highly efficient single bath waterproofing agent; said to be very stable, readily soluble.

Resitex—(HERCULES)—a slip-proof finish for rayon fabrics. A thermoplastic resin which may be so modified as to produce any desired hand in the goods. It is said to be resistant to dry cleaning fluids and laundry practice for rayons. Compatible with gums, starches, and finishing oils and softeners, it is stated that Resitex can be used with regular equipment.

RHoplexes — (ROHM) — The list of synthetic resin emulsions which Rohm & Haas manufacture under this name has been considerably extended. The newest members are RHoplex W-G2, RHoplex W-F40, RHoplex W-F1, etc. The entire range has been considerably improved by this extention. These products are intended for permanently finishing all types and grades of textile fibers and fabrics.

S

Simol T—(GEIGY)—a water-proofing compound giving a coating to fibers which serves as a water shedder. When properly applied, the cloth is said to remain porous, yet water repellent.

Smite—(AQUA)—a water soluble organic compound applied substantively in the dyeing or rinsing of woolens resulting in a moth proofness which is said to be permanent to dry cleaning. It is further said that it will not affect the hand or color of fabrics.

Solidogen B—(GENERAL)—a product which is recommended by the manufacturers for improving the fastness to water of direct dyeings. The latest working methods, which were gained from practical experience, are outlined in the circular and interesting comparisons of dyeings without and with Solidogen B aftertreatment are given as regards their water fastness.

Soluol A G F—(SOLUOL)—a new product and process to inhibit the fading of colors on rayon fabrics due to atmospheric conditions. It is claimed that this process definitely overcomes the fading difficulties due to combustible gases in the atmosphere. The process will presently be available to the finishing field, on a license basis only, under regulations governing its application. All goods treated by the A G F process will bear identifying trade-marked tags or labels. It is pointed out that the process is not a finish but is simply a process to prevent or inhibit acid fading and that its application to an acetate rayon fabric does not in any way impart to the fabric any physical characteristics as to hand, body or finish, different from those which the fabric itself inherently possesses.

Solventol M-14—(BURKART)—prespotter for grease and oil stains. It contains 85 per cent of solvents, with sufficient emulsifier to permit easy removal in subsequent operations. It is used in textile mills and laundries on hard-to-remove oil, paints, or tar spots. It is said to be mild and safe for both the operative and the textiles.

Sorbitan—(HART)—a synthetic finishing compound said to possess exceptional softening properties. It is said to be highly resistant to hard water, salts, acids, alkalis, etc. and is recommended by the manufacturers for the finishing of knitting yarns, cotton and rayon piece goods, etc.

Sulfanole P. B.* — (WARWICK) — for soaping, scouring, boiloff, and dyeing operations. A soap substitute said to possess properties normally associated with sulfonated fatty alcohols. It is

said to be resistant to acid, alkali, hard water and metallic salts. It is claimed to be efficient as a detergent or scouring agent, as well as a dyeing assistant and possess excellent rinsing speed. It is stated that it will markedly reduce the cost and increase the efficiency of any operation in which soap is usually employed.

* Pat. applied for.

Supersulfate "F S" Powder—(LAUREL) — a higher alcohol type product used in the scouring, dyeing, and finishing of all fabrics. It contains all the features of Laurel Supersulfate "F" and "N" and in addition possesses excellent penetrating properties. It will make a clear solution which will be stable under acid or alkaline conditions, and will eliminate the formation of lime soaps from hard water conditions, it is claimed.

Surfax—(HOUGHTON)—a new surface active agent said to be adaptable to a wide variety of wet processes in the textile industry and to possess a rapid wetting out, penetrating and dispersing ability. It is claimed that this product possesses the following properties: good wetting out and penetrating; efficient scouring and detergent properties; good emulsifying agent; good dispersing agent; chemically neutral material; easily soluble in water; easily rinsed out of fibrous materials; stable to all conditions under which it can be used; economical. It is a white, granular powdered substance.

Surfax W. O.—(HOUGHTON)—an oil used as a wetting out and softening agent. It has no detergent properties. It is particularly recommended by the manufacturers for wetting out and dyeing of hosiery, cotton, wool, rayon and silk yarns and all types of underwear and piece goods. It is further said to be particularly adaptable for sanforizing and softening processes where a wetting out agent is required. It is stated that this product will operate under any conditions where sulfonated oils have been previously used.

T

Tenesol B Concentrate — (BURKART)—new and concentrated form of the familiar Tenesol. It is a conditioning and twist-setting agent, said to be absolutely neutral in reaction and harmless to fibers and to machinery. It is said to contain highly effective antiseptics for inhibition of mold and mildew and to be pleasant and safe to use.

Tensol — (SYNTHETIC) — a single substance belonging to the chemical class of sulfonated ethers and said to possess exceptionally powerful surface tension properties allowing complete penetration of liquids into textile fabrics. It is said to be a dispersing agent, emulsifier and colloidal film breaker.

Titawet I T Conc—(TITAN)—a penetrating agent. It is stated that, according to the Clarkson-Draves test, a 1 per cent solution affords instant penetration, as will also a ½ per cent solution. Penetration with ¼ per cent solution is said to be 6½ seconds and with ⅛ per cent solution to be 34 seconds. It is further claimed that it stands up well and will give practically the same time of penetration in 2 per cent caustic solution or 2 per cent sulfuric acid solution. In a calcium chloride solution of 400 p.p.m. a 1 per cent solution shows instant penetration and a ½ per cent solution in 4½ seconds, it is claimed.

Transferoff—(EXTRACT)—a product intended for use in removing transfers from hosiery. It is stated that this product will save the processor a great deal in time and money as it will remove the hardest transfers in a practical way in approximately 8 to 10 minutes. It is said to be very soluble and will work along with the regular equipment that is found in the dyehouse.

Triton K-60—(ROHM)—during the past year the manufacture of this chemical was dropped entirely, and then a new synthetic plasticizer under the same name was brought out. The new material is said to be more stable to acid, more uniform, and much easier to handle under plant conditions. It is not completely soluble in water, but if simple directions are followed smooth, stable, dispersions of this onium compound are obtained. The manufacturers believe that Triton K-60 is one of the most powerful and economical softeners which is commercially available in this country.

Triton M-25—(ROHM)—the nature of this mercerizing assistant has been considerably improved during the past year. Triton M-7 has been dropped, and Triton M-25 is now available in caustic solutions from four to forty per cent concentration.

Triton 720—(ROHM)—This is said to be a very powerful synthetic detergent which is effective in acid, neutral, or alkaline solutions, and which is proof against hard water. Triton 720 is one of the most powerful detergents which Rohm & Haas have tested in their laboratories. It is recommended freely by the manufacturers for use on textile fabrics.

U

Unipan A — (CARBIC) — a product which, when added to the dyebath of the faster Indigosols, is said to prevent precipitation of the color and to ensure more level and better penetrated dyeings. Its use enables the dyer to produce light shades said to be of excellent fastness on viscose or Bemberg rayons, cotton or linen, in one operation in an open winch.

V

Vegan Salt A — (GENERAL) — an auxiliary for the dyeing of mixed yarns and fabrics of spun rayon and wool or cotton and wool. It is said to prevent the reduction by boiling, experienced with a number of direct dyestuffs and neutral dyeing wool dyestuffs. Furthermore, it is said to prevent the gradual decrease in depth of rayon or cotton mixed with wool which occurs in longer boiling. Therefore, it is claimed, it produces a greater reliability in matching mixed fibers.

Vitaperm Finish — (ONYX) — a permanent finish for all fabrics.

W

Water Repellent No. 50—(LAUREL)—an improved product which it is claimed will produce a water repellent effect on cotton, rayon, wool, silk, and all type textile fabrics. It is said to be especially valuable on silk hosiery producing a good water repellent finish. It is used with delustering compounds and other finishing products and will not develop spots, it is said.

Weave-Lok*—(WARWICK)—a new slip proofing agent for all types of silk or synthetic fabrics. It is said to prevent slipping, sagging or fraying and to stop pulling at the seams. It is further said to eliminate the use of any other finishing agents and improve the feel and appearance of the cloth.

* Reg. U. S. Pat. Off.

Weighter No. 406 — (LAUREL) — a granular product which will add weight to all type fabrics, either piece goods

or skein. It will increase softness of the material processed. It may be applied to bleached or dyed goods without change of shade.

Wetsit — (WOLF) — Wetsit is a recent development in the field of synthetic organic chemicals, known as surface active agents. This product is said to maintain its efficiency in great dilutions and to be stable to all conditions usually met in the cleaning and detergent industry. In addition to wetting out, it is said to have emulsifying, penetrating, dispersing and detergent properties. It is stated that Wetsit is not affected by the lime and magnesium salts of hard water and is equally efficient in neutral, acid or alkaline conditions. It is a neutral product, having a pH of 7.0 to 7.2 and when dissolved in water does not hydrolize to give free alkalis.

While Wetsit is designed primarily as a textile wetting assistant, it is said that it can be used equally advantageously in the leather, paper, cosmetic, insecticide, fruit, steel and other industries.

Wool Oil "B"—(LAUREL)—a soluble oil producing a rich milky emulsion used as a spinning lubricator on all types of wool material and shoddy. It is stated the Wool Oil "B" is specially prepared so as to produce maximum lubrication, and may be removed in the regular scouring process. It will not develop greasy conditions or clog the combs.

X

Xynol RA No. 4—(ONYX)—a softening agent for all types of fabrics.

Xynosan Print Wash — (ONYX) — this is said to combine detergent effectiveness with a permanent softening action.

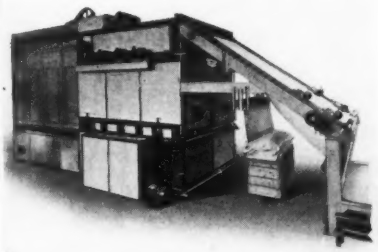
Z

Zelan—(DUPONT)—a durable water repellent; a complex organic chemical compound, essential components of which combine with certain reactive groups of the textile fibers, giving a finish that is said to be highly water repellent and of great stability. It is stated that it is used as a textile finishing agent to impart lasting water repellency, spot and stain resistance and also as a softening agent.

EQUIPMENT

C

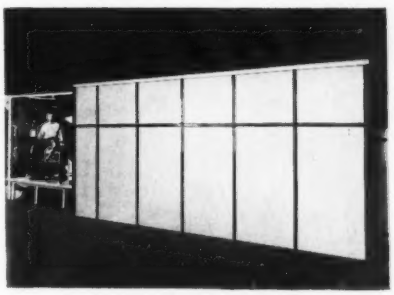
Cloth Tentering and Carbonizing Unit —(RIGGS)—a new addition to the Fleet Line. Designed for piece carbonizing of woolens and worsteds this machine has a capacity of 900 pounds per hour. The cloth, wet with dilute acid, is run automatically through the tenter



Riggs & Lombard Cloth Tentering and Carbonizing Unit

(equipped with automatic guider and stops) where it is thoroughly dried and set to width. Then it is stripped from the tenter pins and drawn through the baking unit for final carbonization of vegetable matter.

Conditioner—(HUNTER) — the new Hunter Brilsonair Cloth Conditioner, embodying a totally new principle of restoring natural moisture to cloth after finishing and said to be setting new records for evenness and uniformity, flexibility and production. The Conditioner comes com-

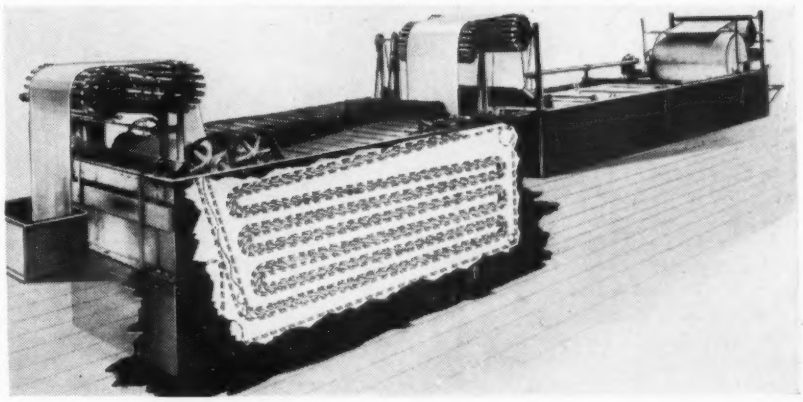


Hunter Conditioner

plete with air conditioning unit, the necessary motors, fans, heating coils, housing and control instruments. It is stated that any mill man interested in guaranteed evenness of regain at high speeds, reduction of off-shade goods, flexibility and uniformity will be interested in this machine.

Conveyor Type Machine—(VAN)—a loose-form, full-width conveyor-type machine for open-width boil-off, scouring, chemicing and all other operations which require time process. It is stated that the machine has proven itself admirably adapted to the handling of fabrics in the full width without tension. Due to the variations in speeds obtainable through six Reeves Drives, almost infinite changes can be made in the time processing of fabrics. It is claimed that this is one of the foremost steps made in the processing of fabrics. Since the goods are handled in full width, without tension, full and natural shrinkages are said to be obtained.

Van Vlaanderen Conveyor Type Machine

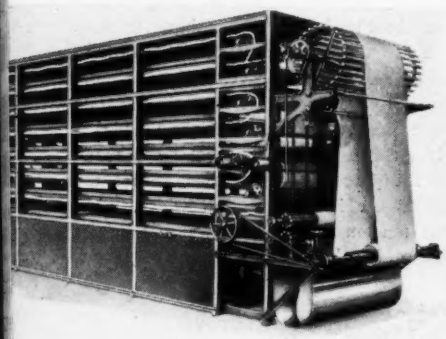


D

Desizing Machine—(VAN)—a newly designed desizing machine which is intended especially for the handling of alpacas and romaines.

Dye and Tanning Wheel—(PFAUDLER)—a new glass lined dye and tanning wheel which is now in operation in one of the large New England tanneries. The entire inner surface is glass lined and is provided with enameled pins which are so staggered as to pick up the material as the wheel revolves. The high acid resisting glass enamel is said to be impervious to dyes, greases and other solutions. It is also said that the wheels are easy to clean and dyeing materials do not adhere to the glass interior. It is also claimed that different colors can be dyed in quick succession with no danger of discoloring subsequent batches. Although this wheel was designed especially for the tanning industry it is believed that it will prove equally successful in the textile field and the company is willing to undertake development work in this direction.

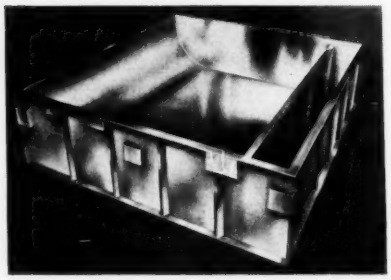
Dryer — (VAN) — a tensionless, conveyor-type, full-width, horizontal dryer which is a modernized version of one of the earlier drying machines which has been successfully used in the past. Now, through the redesigning of the air circulation and recirculation systems and



Van Vlaanderen Dryer

other important changes in the detail of the machine, a machine has been produced which is said to allow the full and natural shrinkage since the goods are carried on cork tubes in small festoons and, since the goods are turned over and over in the course of the drying, even and perfect drying is insured. It is stated that no tension is placed on the goods and through the circulation and recirculation of air temperatures in this machine are obtained which are suitable for resin finishing.

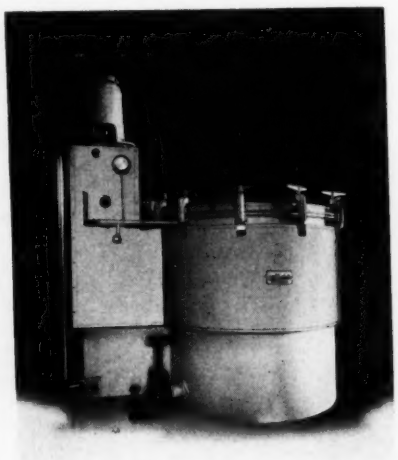
Dye Boxes—(BLICKMAN)—of stainless steel construction. It is a self-supporting tank to which can be attached



Blickman Dye Box

present equipment. They are electrically welded and of rounded corner construction. It is stated that they are corrosion-resistant and may be easily and speedily cleaned as there are no intersections where reagents may lodge.

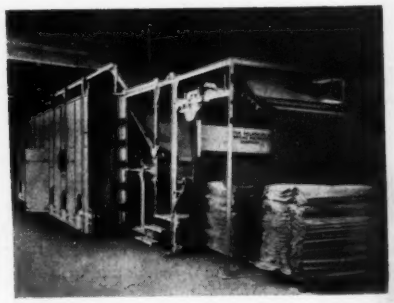
Dyeing Machine—(RIGGS)—a new stainless steel stock dyeing machine. It embodies a new design in that the main kettle and expansion tank are one unit eliminating all outside pipes, valves, fittings, etc., except those required to bring steam and water to the machine and take away the drainage. This machine has a capacity of 500 to 600 pounds. The pump is submerged in the dye liquor and is driven by vertical motor. It is claimed that this machine is suitable for dyeing all types of wool from a fine noil to a coarse carpet stock; it also handles a full load of cotton or rayon.



Riggs & Lombard Stock Dyeing Machine

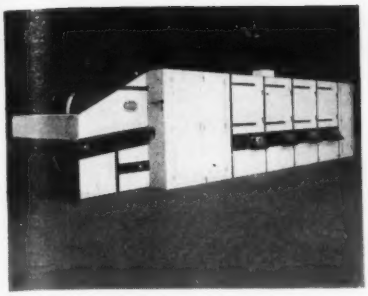
Dryer — (PHILADELPHIA) — the new "Hurricane" tenter dryer which operates upon the principle of "penetration drying." This method of drying circulates the air through the cloth instead of being directed across the surface of the cloth. "Penetration drying" is said to permit the design of a dryer which is capable of drying cloth in one-half to one-third the time now required for old dryers. Furthermore, the dryers are said to be small, compact units, capable of reducing labor costs based upon present operating standards for radiant heat dryers or those circulating the air across the surface of the fabric. Extended surface heaters are used to secure an efficient transmission of heat from the steam. It is stated that the air is circulated through the dryer so as to give maximum economy. The entering air cools the cloth at the delivery end. Preheating the entering air and simultaneously cooling the cloth conserves the use of the heat supplied to the dryer. The exhaust air is taken from the pressure side of the fan where is passes through the cloth at the entering end of the Dryer. Therefore, the rapid drying of fine fabrics may be secured at lower temperatures with "penetration drying," thus eliminating the possibility of damaging the fabric, it is claimed. The individual fan motor assembly permits operation of the Dryer at reduced capacity in case of failure of any one fan unit. Repairs may be quickly made with the fan and motor unit construction. The special construction provides a tight joint through the use of a cork seal. The panels have 1½ inches of rock wool insulation; the interior construction is streamlined in order to offer minimum resistance to air circulation.

Dryer —(HUNTER)— the Automatic Rotary Feeder and Raw Stock Dryer. This is said to be the newest aid to lower cost and higher production automatic raw stock feeding and drying. This new unit con-



"Hurricane" Tenter Dryer

sists of a novel rotary automatic feed usually built as an integral part of the Hunter Duplex Raw Stock Dryer. It is stated that the use of the Rotary Feed, as built exclusively by Hunter, means an end to



Hunter Feeder and Dryer

ordinary maintenance costs, elimination of feed droppings, greatly reduced cleaning time between runs, and an assurance that practically all stock fed into the hopper will be delivered at the discharge end of the dryer apron. The Rotary Feed may be furnished also as a separate unit to replace old feeders. It is said to be adaptable to any type or kind of raw stock and is available in any width or capacity. It may be used to feed any machine commonly requiring either hand or automatic feeding of stock.

E

Expander—(VAN)—a newly designed expander of wooden slat style and also one of the rubber type.

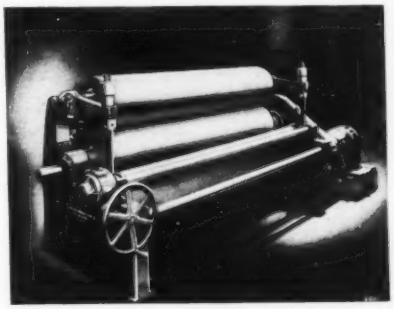
J

Jig—(VAN)—a tensionless dye jig which has been designed for the full width dyeing and processing of acetates and other materials. The tensionless processing is obtained through the differential driving of each of the batch rolls so that one driven roll deposits the goods in the liquor and the other takes the goods out of the liquor. It is stated that the goods are also processed at a constant speed and that the refinements of this machine produce excellent results on fabrics which must be processed without tension.

Van Vlaanderen Dye Jig

P

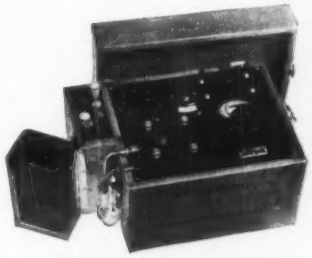
Padder — (BUTTERWORTH) — a new streamline machine which has a micrometer pressure adjustment which is easily and almost instantly applied by the hand wheel which is also used to raise the roll from contact when not in use. There is another micrometer adjustment arrangement for applying pressure to each side of roll to insure uniform dyeing. The Padder can be operated as a unit by addition of friction let-off and winder or in range with other machines. Ultra Padders are made in three sizes. They all have ball bearings of latest design. Standard tub is all stainless steel with stainless steel immersion rolls as required.



Butterworth Padder

pH Indicator — (LEEDS) — the new Universal, shown for the first time at the last Chemical Exposition, this versatile instrument reads directly in pH with Glass, Quinhydrone, Hydrogen or any other electrode following the Nernst equation. When used with the glass electrode system furnished, simply setting the dial of the temperature compensator adapts the entire pH scale to measurements at that temperature. This applies also if a quinhydrone electrode is substituted for the glass electrode. Equipped with a voltage scale as well as a pH scale, it is also used in oxidation-reduction potential measurements, and in current and resistance determinations. It can be used with external circuits of much higher resistance than the 100 to 300 megohms of the glass electrode which is supplied with it.

This newly-designed glass electrode is small, comparatively rugged, and requires only a 5 ml sample for measurement. Everything necessary for glass electrode measurements is included with the instrument.



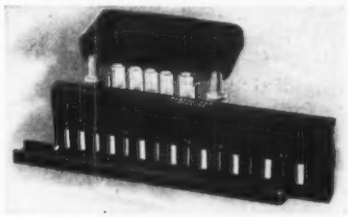
Universal pH Indicator

Other features include: quartz insulation, where necessary, to avoid leakage errors; a separate battery compartment to prevent corrosion; unimpaired accuracy in atmospheres of up to 95 per cent relative humidity; the ability to make sodium corrections, where necessary, directly in pH units.

The Universal pH Indicator is designed to operate for years at full sensitivity and accuracy. Compactly built it is readily portable and retains all of the traditional L&N reliability and excellence of workmanship.

pH Slide Comparator—(TAYLOR)—a new Slide Comparator for the colorimetric determination of pH, chlorine and phosphates.

The new outfit is molded entirely from plastic. It is stated that radical changes in design have resulted in marked improvement in appearance, durability and ease of handling. The weight has also been considerably reduced. All pH, chlorine and phosphate values, as well as the indicator names, are engraved in white directly on the plastic slides. Improved catches are used to hold the top on the base and all metal parts are rustproof. The whole outfit, including the slide is 10 in. long, 2⅛ in. wide and 4 in. high and weighs only 1½ lbs.



Taylor Slide Comparator

The new Comparator consists of a slide and a base. Each slide contains 9 color standards alternating with ampoules of distilled water. All color standards are guaranteed by the manufacturer to maintain their accuracy for a period of 5 years.

The base contains 2 vials of indicator solution, with 0.5cc pipettes, 5-5cc test tubes, and a piece of etched glass in a special compartment. Determinations are made by filling three of the test tubes with the test sample, adding 0.5cc of indicator solution to the middle one, placing the slide on the base and moving it back and forth until the test sample matches one of the color standards. The pH, chlorine or phosphate value is then read off directly from the values on the slide. One base can be used with any number of color standard slides. Full information on these outfits can be obtained from the manufacturer.

R

Reels — (BLICKMAN) — fabricated from stainless steel which, it is stated, are subject to neither rust nor corrosion and there is no frequent repair expense. They are available in any shape or size.

Blickman Reel

S

Stienen Extracting and Drying System for Cotton Yarn Packages — (OBERMAIER) — consisting of two units:—the Closed Extractor and the Closed Dryer. **Closed Extractor**—an extractor in which the moisture is taken out by pressure. It is stated that after several installations of this machine had been made it was found that it eliminated the labor question and extracted down to 50 per cent to 55 per cent of the dried weight of the yarn. The process of extraction is very simple in that a dyed material carrier is put in the closed machine and the motor started by a push button control. It is stated by Obermaier that the results obtained by this extractor are best proven by the number of re-orders and the number of change-overs from other extracting systems. **Closed Drier**—It is stated that Obermaier has developed, patented and put into operation a closed drier with a blower system in which only the original air in the dry tank is used continuously until complete drying is accomplished. It is claimed that this dryer eliminates any labor problem, eliminates the disadvantage of dirty air conditions encountered in certain localities and further reduces the amount of drying time. In this drier hot air is blown from a compressor into the closed tank; the returning air is led over a condenser and connected directly to the intake of the blower again. Through this method atmospheric conditions are eliminated from consideration and it is stated that, on the first installation made, it was found that bleached white yarns did not show the slightest trace of dirt, the steam consumption was reduced to a minimum and the drying time was shortened.

Installation of Stienen System

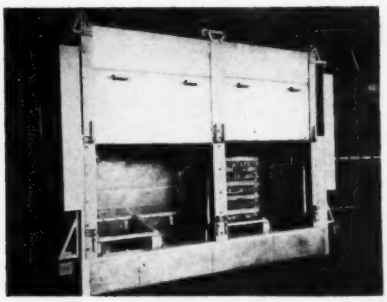
Blickman Portable Tank

T

Tank—(BLICKMAN)—a new portable dye mixing tank of stainless steel. It is equipped with an adjustable agitator. It is stated that with this unit a person can easily and speedily transfer dyes to vats, tanks or dye boxes and permit mixing at a central point. The tank is of stainless steel, of all welded construction and has smoothly rounded corners. The tank is bolted to the stand with stainless steel bolts and nuts. The frame also is of stainless steel and the wheels are of acid resistant rubber. It is stated that the agitator makes dye mixing uniform, accurate and speedy. The agitator shafts and propellers are of stainless steel. The tanks can be furnished in any size, from 50 to 500 gallons capacity.

Y

Yarn Steamer—(RIGGS)—a positive pressure yarn steamer, a new addition to the Fleet Line. Claims made include: twice the production of the conventional machine of this type, when used for steaming only; used for steaming and conditioning its product is equal to that of the steamed yarn which has stood for 24 hours. The machine circulates humidified atmosphere through the trucks of yarn under a slight pressure, with the aid of a vacuum in the upper chamber. Temperature, humidity and length of treatment are all automatic; no manual attention is necessary except for loading and unloading. A light or other signal indicates the completion of the cycle.



Fleet Line Yarn Steamer

Key to Manufacturers Names

AAP—American Aniline Products, 50 Union Square, New York, N. Y.

ALCO—Alco Oil & Chemical Corp., Trenton Ave. and William Street, Philadelphia, Pa.

AQUA—Aqua-Sec Corp., 1450 Broadway, New York, N. Y.

ARKANSAS—Arkansas Co., Inc., 233 Broadway, New York, N. Y.

BLICKMAN—S. Blickman, Inc., Weehawken, N. J.

BURKART—Burkart-Schier Chemical Co., Chattanooga, Tenn.

BUTTERWORTH—H. W. Butterworth & Sons Co., York and Cedar Streets, Philadelphia, Pa.

CALCO—Calco Chemical Co., Inc., Bound Brook, N. J.

CARBIC—Carbic Color & Chemical Co., Inc., 451 Washington Street, New York, N. Y.

CARBIDE—Carbide & Carbon Chemicals Corp., 30 East 42nd Street, New York, N. Y.

CELANESE—Celanese Corp. of America, 180 Madison Ave., New York, N. Y.

CIBA—Ciba Company, Inc., Greenwich and Morton Sts., New York, N. Y.

COMMONWEALTH—Commonwealth Color & Chemical Co., Nevins, Butler and Baltic Streets, Brooklyn, N. Y.

CREATIVE—Creative Chemical Co., Bloomfield P. O. Station, Pittsburgh, Pa.

CYANAMID—American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.

DETERGENT—Detergent Products Corp., Atlanta, Ga.

DUPONT—E. I. duPont de Nemours & Co., Inc., Wilmington, Del.

EXTRACT—American Aniline & Extract Co., Inc., Venango and F. Streets, Philadelphia, Pa.

FANCO—W. F. Fancourt & Co., 516 S. Delaware Ave., Philadelphia, Pa.

GEIGY—Geigy Company, Inc., 89 Barclay St., New York, N. Y.

GENERAL—General Dyestuff Corp., 435 Hudson Street, New York, N. Y.

HART—Hart Products Corp., 1440 Broadway, New York, N. Y.

HERCULES—Hercules Powder Co., Wilmington, Del.

HOUGHTON—E. F. Houghton & Co., Third, American and Somerset Sts., Philadelphia, Pa.

HYGROLIT—Hygrolit, Inc., Kearny, N. J.

HUNTER—James Hunter Machine Co., North Adams, Mass.

KEM—Kem Products Co., 229 High Street, Newark, N. J.

LAUREL—Laurel Soap Mfg. Co., Inc., Tioga, Thompson and Almond Sts., Philadelphia, Pa.

LEEDS—Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia, Pa.

NATIONAL—National Aniline & Chemical Co., 40 Rector Street, New York, N. Y.

NIACET—Niacet Chemicals Corp., Pine Ave. and 47th Street, Niagara Falls, N. Y.

NOPCO—National Oil Products Co., Inc., First and Essex Streets, Harrison, N. J.

NYANZA—Nyanza Color & Chemical Co., Inc., 215 Water Street, New York, N. Y.

OBERMAIER—American Obermaier Corp., 11-20 49th Ave., Long Island City, N. Y.

ONYX—Onyx Oil & Chemical Co., Jersey City, N. J.

PFAUDLER—The Pfaudler Co., 89 East Ave., Rochester, N. Y.

PHILADELPHIA—Philadelphia Drying Machinery Co., 3351 Stokley Street, Philadelphia, Pa.

PROCTER—Procter & Gamble, Cincinnati, Ohio.

QUAKER—Quaker Chemical Products Corp., Conshohocken, Pa.

REFINED—Refined Products Corp., 1000 Narragansett Blvd., Providence, R. I.

RIGGS—Riggs & Lombard, Inc., Lowell, Massachusetts.

ROHM—Rohm & Haas Co., Inc., 222 West Washington Square, Philadelphia, Pa.

SANDOZ—Sandoz Chemical Works, 61 Van Dam Street, New York, N. Y.

SOLUOL—Soluol Corp., Providence, R. I.

SYNTHETIC—Synthetic Chemicals, Inc., 57 Wilkinson Ave., Jersey City, N. J.

TITAN—Titan Chemical Products, Inc., Mill Road and Wayne St., Jersey City, N. J.

TAYLOR—W. A. Taylor & Co., 872 Linden Ave., Baltimore, Md.

VAN—Van Vlaanderen Machine Co., Paterson, N. J.

WARWICK—Warwick Chemical Co., Warwick, R. I.

WOLF—Jacques Wolf & Co., Passaic,

Recent Developments in the

Rayon Industry

B. L. HATHORNE

CONTINUOUS SPUN RAYON

THE most important forward step of the rayon industry in years is the successful development of a machine for processing rayon continuously from the spinneret to the yarn in a single continuous operation.

The Industrial Rayon Corporation has announced the opening of their new twelve million pound per year plant for producing rayon by this system. Though the thought of producing rayon continuously from a spinneret to a finished package is old and was put into operation in a small way on the cuprammonium process sometime ago, the Industrial Rayon Corporation has taken this idea, and, through the expenditure of more than two million dollars in research over a five-year period plus the investing of twelve million dollars in a new plant, have reduced it to an actuality and have thus made the major contribution in years to the industry.

The new process, through eliminating tension guides, which are the primary source of dye variation in rayons, has succeeded in producing yarn so much more uniform than viscose process rayon spun on the conventional machines that it must be considered to be actually a new yarn.

SYNTHETIC RESIN RAYON

The Du Pont Company has produced a new rayon, a purely synthetic resin, that possesses wet and dry tensile strength equal to real silk and that is very much more elastic than real silk.

This new fiber is not yet available commercially but is expected to be on the market in the near future and will, undoubtedly, make rapid inroads on real silk's last stronghold—the hosiery industry.

It should produce ringless hosiery without the aid of special machine attachments and should produce hose substantially more sheer in appearance because the fiber is more compact than real silk.

The Carbon & Carbide Corporation has produced a new vinyl resin yarn that has become interesting during the past year because the cost of producing the resin itself has now been lowered to a point that makes it commercially feasible. It is generally expected that one of the rayon producers will market this yarn to the trade soon.

The Celanese Corporation of America has announced a new yarn made by a new process but has not yet announced the chemical nature of their development.

SUPER STRENGTH VISCOSE

The American Viscose Company has marketed a new yarn, known as tenasco, that has a wet tensile strength of 1.3 grams per denier, dry tensile of 2.6 grams per denier and an elongation of 18 per cent. This fiber shows sufficient strength to have real possibilities in the full fashioned field and may win a place for itself in the lower bracket numbers. In ladies' dress fabrics, particularly light weight satins, it has already proved itself to have a very definite place.

TECA ACETATE CUT STAPLE

This fiber, brought out by the Tennessee Eastman Corporation, is outstanding among acetate cut staples because it has an inherent crimp which is the normal form of the fiber and which gives it unique properties. It has far exceeded all expectations of the trade due to wise styling and merchandising as much as to the inherent physical properties of the fiber itself. Because of its wool-like characteristics, Teca usually replaces wool in blends rather than being blended with wool. It is much used alone in yarns. Alone and in combination with other fibers it has been manufactured into fabrics having new and distinctly valuable properties. For example, a man's suit made of this fiber when properly pressed, retains its press substantially longer than suits made of the finest wools and mohairs. It has, of course, brought its own peculiar dyeing problems which, however, are rapidly being overcome.

"DIS-CONTINUOUS" FILAMENT RAYON

The Tubize Chatillon Corporation brought out a new yarn originally called "bearded acetate." This yarn consists of a substantially continuous filament yarn with broken filaments projecting from the surface in such a way that the yarn stands part way between continuous filament yarn on the one side and spun yarn on the other. It enables special effects to be obtained and has found a place for itself in the fabric field. Other producers have since offered similar yarns.

The Tennessee Eastman Corporation has recently announced a related yarn made under the Berry Lohrke patents (called the Berlok system). The new Tennessee yarn will be closer to spun acetate inasmuch as all of the filaments are broken, whereas the Tubize development consists of yarn that is basically a continuous filament yarn, part only of the filaments being broken.

LANITAL CASEIN FIBER

This fiber, produced by Snia Viscosa in Italy and merchandised by Meyer & Marks Yarn Co., Inc., of New York in the United States, is more truly a "synthetic wool" than any of the previously offered artificial wools.

Lanital is made by exuding solubilized casein from milk into a precipitating bath on the conventional type of cut staple spinning machinery. It is being produced in Italy at the rate of 25,000 pounds a day and is being consumed very nearly at this same rate leaving a limited amount only available for export. Exhibited fabrics consisting of blends of lanital with other fibers indicate that substantial quantities can be expected to be consumed by the domestic market and warrant the contemplated erection of a plant in this country.

"VICU" CUT STAPLE

"Vicu" is a cuprammonium base cut staple fiber. It is substantially more resilient than the viscose type of cut staple and is, therefore, more suited for men's wear resilient type of fabric, for example, light weight suitings.

At present it is primarily a German proposition, being both manufactured and consumed in Germany. As soon as production within Germany catches up with the German market this fiber can be expected to appear in other countries including the United States.

SPUN RAYON STYLING

Any discussion of recent developments in the rayon industry would be quite incomplete without a discussion of the extreme importance of special styling to the spun rayon industry. Fabric design, taking into account the properties of the various cut staple fibers and the dyeing problems presented, combined with proper understanding of the changes in physical properties that can be produced by resin treatments after dyeing, have been primarily responsible for the phenomenal growth of the popularity of spun rayon. The industry owes a debt of gratitude to the far sighted fabric designers who have gambled on new developments in this field.

GROWTH IN POPULARITY OF COMBINATION YARN FABRICS

A development of great importance to the dyeing industry of the past year has been the tremendous increase in popularity of the combination yarn fabric of the "Alpaca" and "Romaine" type. These fabrics, made completely, or largely, of viscose crepe yarn doubled with acetate, have proven themselves to be extremely difficult to dye and, as a matter of fact, have been successfully processed during the past year only by the most careful and painstaking dyers.

The merchandising of the commission dyeing end of this industry has been notably poorly handled. The few people who have been able to dye the fabric well have allowed their prices to be reduced to such an extent that procedures have had to be changed to meet prices, the final result being a relatively chaotic condition in what should have been a very profitable development.

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Progress in

Wool Dyeing

ANDREW FISHER

TALKING about wool is like talking about people. There are a million different kinds and also looks are deceiving. Wool may mean anything, even old rags, rayon waste, silk, cotton, shoddy, jute, hemp, hair, straw and sometimes new wool right off the sheep's back. Today cut rayon staple is working into wool and worsted very extensively. They even try to dye union colors on mixtures of top and rayon staple for fine men's wear worsteds. Nothing much along that line will stand up against steaming in finishing this grade of fabrics. The best mills dye the rayon first with sulfur or vat colors.

The two most important qualifications for a dyer in a woolen mill are a good training in cotton and rayon dyeing and plenty of patience. The best work in union dyeing depends on the proper selection of dyestuffs. The research chemist has made some progress along these lines, also the proper control of temperature and time by automatic recording and regulating apparatus. Thus it is a little easier today to put the wool color on the wool and not alter the shade of the cotton. More progress has been made along these lines than in any other branch of wool dyeing.

The factors entering into the dye bath are controlled to some extent by the size of the molecule and the hydrogen ion concentration. The more recent developments of stainless steel for use in dyeing machines makes this chemical control more important. There are so many different kinds of stainless steel that it does not pay to fool with big installations until the experimental laboratory has O.K'd the proposition based on your own particular conditions.

Adequate laboratory control of the whole dyeing problem has been made much more valuable and efficient by

improved apparatus. A couple of outstanding things are Abbott's pad making machine and Prisley's piece dye apparatus. Prisley takes the cloth and wraps it around a small glass cylinder and sets this into a circular jar containing the dyestuff solution. The inside cylinder circulates and the centrifugal force gives great results. The toughest fabrics are penetrated. Abbott's pad making machine is a very important thing for top dyers who wish to keep compact records of work done and a close check on results.

The outstanding feature of progress in wool dyeing then is more adequate laboratory control made necessary by the variety of problems which confront the dyer. You must have brains and experience to select the best dyestuffs and these can only be determined by adequate laboratory experiments based on your own particular problem.

You must have capital enough to have the last word in stainless dyeing equipment, a first class filter and water-treating apparatus and all the gadgets necessary for controlling temperature and chemical conditions necessary for maximum efficiency.

The well-equipped laboratory of the dyestuffs dealer is a great help to most mills and the average small mill will be better off in the long run if it sends its goods to be dyed and finished to a job dyehouse. The up to date job dyer knows just what the answer is to every problem which arises. He adjusts himself quickly to changes in fabric construction which is the worst headache the woolen industry faces today.

I would say that progress in wool dyeing is slow but sure. We know more about the carbonizing problem and how it affects subsequent dyeing operations and the research worker may have some credit here. All in all it seems to me that progress depends on hard work and well directed research going along together and that seems to be the case today.

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Progress in the

Resin Finishing of Textile Fabrics

DONALD H. POWERS*

THE year 1938 has seen a steady increase in the use of synthetic resins for textile finishing. While there are over a dozen important classes of resins, only two of them have found a growing demand in the textile industry. These two classes of resins are the *urea formaldehydes* and the *acrylates*. Both of them are particularly suited for textiles because of their freedom from color, their light stability and their ease of application from aqueous solution. Some of the more important effects which they have produced are for:

Anti-crease
Printing Effects
Stabilization
Finishing.

UREA FORMALDEHYDE RESINS

The *urea formaldehyde* resins include those resinous products obtained from condensing urea, thiourea or modified urea with formaldehyde or one of its derivatives. While the polymerization occurs quickly, a tremendous variation in the type of resin formed occurs depending on the ratio of materials used, the temperature, and the pH at which they react. Widely different effects can be obtained on textile fabrics depending on which urea formaldehyde resin is used. It is possible to obtain a stiff wiry finish with a low percentage of resin or a soft finish using five times as much, but with a different resin polymer. A better understanding of these urea formaldehyde resins has made it possible to produce a wide range of effects with this clear glass-like resin. These resins are characterized by their complete insolubility in organic or dry cleaning solvents, and by their freedom from tackiness or stickiness when heated, ironed or calendered.

ACRYLATE RESINS

The *acrylate resins* include the polymers of acrylic and methacrylic acid, and their esters, amides, halides and nitriles. They are noted for their clarity and complete absence of color and by their elasticity and toughness in the absence of plasticizers or softeners. By varying the chemical composition of acrylates, permanently hard or soft resins can be produced, eliminating the need for plasticizers which will be slowly removed or extracted from the resin film. The acrylate resins are never water soluble but it is possible to polymerize them in aqueous emulsion to produce unusually fine and stable resin dispersions entirely free from organic solvents. It has also been found that unusual and unique effects can be produced by polymerizing a mixture of two or more acrylates producing *copolymers* in contrast to the entirely different effects obtained using a mixture of the same acrylates after polymerization. These copolymers are striking in the fullness and bulk which they impart to a fabric. The acrylate resins are

*Rohm & Haas Co., Inc., Philadelphia, Pa.

extremely wash fast and show less wash down on repeated washings than the untreated fabric itself. Because of their clarity they usually give brighter color effects than starches or gums, and because of their high film strength they are particularly useful for reducing fuzziness and tendency to slip or stretch during cutting or processing.

ANTICREASE FINISH

This finish was developed a little over ten years ago by Tootal Broadhurst Lee Co. of Manchester, England. An increasing number of American textile mills are licensed to produce crush-resistant fabrics as covered by their U. S. Patent 1,734,516. In England T.B.L. Co. anticrease all of their own fabrics and advertise them extensively in the newspapers and stores. In this country they have not put on any advertising campaign and it is probable that this lack of promotion has greatly retarded its rate of development. It is understood, however, that a real drive will be made to promote this crush-resistant process which is so essential to spun rayon fabrics.

The urea formaldehyde resins have been used exclusively in this process and it is essential that only a completely water soluble resin be applied to the absorbent fabrics. While this process has always been of interest and value for cottons and rayons it has become almost essential on all spun rayon fabrics, giving them a fullness and resilience that cannot be matched even with fabrics made entirely of wool. In addition to the increase in resilience, the resin treatment stabilizes the fabrics and makes it possible to give them a full shrinkage without danger of subsequent stretching or pulling at the seams.

PRINTING EFFECTS

The past year has seen real progress in the use of resins as binders for colored pigments. By the use of resins it is possible to eliminate and do away with the usual ageing or after-development of the colors. It is also possible to get bright and unusually light fast prints in blotch or fine line effects. The soft flexible resins replace the starches and gum thickeners usually used and they are not washed out, giving correspondingly better pigment fixation. Resins in organic solvent solution or in aqueous dispersion are being offered and each type has certain advantages. It is too early to predict how far this development will go; but it is safe to say that it is one of the most interesting of the developments showing promise of changing, and possibly simplifying, textile printing.

STABILIZATION

The term *stabilization* is used to cover a wide range of finishes which are being extended to an even wider range—from setting lace curtains against shrinkage to locking denim yarns against stretch. By stabilization is meant the fixation or anchorage of yarns so that the finished fabric holds its shape during subsequent use. It is interesting to note that this *stabilization* is particularly important on fabrics which are sanforized shrunk to prevent them from stretching. With the increasing use of sanforized or full shrunk fabrics the problem of collar band, shirt, dress or trouser shrinkage was overcome but stretch or bulging was more frequently encountered. The incorporation of a small amount of urea formaldehyde or acrylate resin has been shown to stabilize these fabrics to a remarkable degree and as little as one per cent resin, deposited between fibers, eliminates or greatly reduces this stretch or slip. It has also been found that the impregnation and fixation of a small amount of resin before shrinking will materially reduce the yardage lost during this process. The development of this stabilization has depended on the use of soft flexible tough resins as the fabric must not be harshened. The amount of stabilization that can be obtained without materially altering the hand has been surprising.

FINISHING

While resins found little application at first in replacing the usual softeners and finishers, this was because of their difficulty of application and their cost. However, the acrylate resins have been found to be particularly well adapted to finishing because of their absolute clarity, ease of application, stability to storage or oxidation, absence of odor, and effectiveness in extremely low concentrations. While these resins are permanent, the concentrations used for finishing are so small that their permanence can only be determined by a resin analysis of the fabric or by carefully measuring the firmness, fullness or stiffness of the fabric after repeated washings. The ordinary fabric becomes progressively softer on repeated washings, but these resins finished fabrics hold their fullness and hand to a surprising degree. Since these resins are effective in extremely low concentrations, their cost is entirely in line with the usual finishes of less permanent character. While the concentrations used as a finish do not stabilize a fabric, they may perceptibly reduce the variation and change in the fabric dimensions on shrinking or stretching. It has also been possible to obtain extremely soft finishes without the usual oiliness resulting.

While initial resin applications are designed to match existing finishes, it has been found that once they are established and adopted they can be used to produce entirely new and distinct finishes which are much more difficult for a competitor to match.

CONCLUSION

The year 1938 has seen an advance in use of resins for textile finishing. This advance has been primarily due to the ingenuity and resourcefulness of the chemist and superintendent. Their enterprising spirit and skill has adapted resins to a wider range of fabrics and fitted them to all types of mill conditions. Insofar as their use and adoption is fundamentally sound, they may be expected to grow in importance and application. In low concentrations they offer an improved finish at comparable costs and in high concentrations they impart to the fiber and fabric new and frequently unique characteristics,—such as greater elasticity, strength, luster, resilience, toughness or stability. We may consequently expect their use to grow and widen during 1939 in the production of more permanent finishes and the development of new and novel fabrics from natural or synthetic fibers.

Am. Dyestuff Reptr. 27 (1938)

Recent Developments in the

Detergent Field

J. B. CROWE*

DURING the past year, there has been considerable activity within the detergent industry. In this article, only soaps and synthetic detergents, together with assistants which are added to influence or change the properties of the soap itself, will be discussed. In this brief resume, the subject of recent developments in the detergent field will be considered in a general manner, mentioning changing trends and principles rather than specifically naming trade products which have been brought on the market.

SOAP

Insofar as soap itself is concerned, there have been few outstandingly new or different fat stocks introduced. One, however, which has received considerable attention in this country is Tall oil or Tallol.™ Tall oil is derived from the waste liquors of the paper industry, and has been used extensively in Europe, particularly in Sweden and Germany. Tall oil contains a high percentage of rosin acids, some fatty acids—largely oleic, and some non-acids which are supposed to be sterol, higher alcohols and other unsaponifiable substances. The actual percentage of these components vary considerably in the oil and are dependent to a great extent upon the refining methods used. It is said that Tall oil is being blended in some textile soaps sold in this country. However, soaps made from Tall oil have poor sudsing characteristics and are objectionable in the sense that fabrics processed with them may be badly discolored and develop an unpleasant odor upon ageing, unless the soap is thoroughly removed by rinsing. Consequently, it is extremely doubtful that any high quality textile soap in the United States is made with Tall oil, whose use in soaps is confined to those in the low price range. However, with further improvement in the method of handling Tall oil, this product may become of increasing importance as a fat stock in future years.

Synthetic organic water softening agents, resembling sodium metaphosphate in performance, have also been developed and introduced to the textile industry. These products are efficient in sequestering or tying-up calcium and magnesium ions, and their use prevents the formation of sticky lime soaps when soap is used in hard water. Unfortunately, the current price of these organic water softening agents is so high as to retard their adoption and widespread acceptance by the textile industry.

SYNTHETIC DETERGENTS

There is an immense amount of research which is being carried on with the synthetic detergents. The literature is literally swamped with patents being applied for as well as those which have been granted. Some of these newer products are promising and have interesting properties; the majority, however, are definitely inferior to the more popular synthetic detergents which have been on the textile market for several years. It is no simple matter to evaluate these products and, unfortunately, very few mills have the man-power, the equipment, the available time, or the knowledge to test all of them or to interpret the results when they have been obtained. The real danger, however, lies in a mill adopting a product or products because of one or more laboratory tests which may have no true correlation with the plant operations for which the product has been purchased.

Some of the more recent synthetic detergents are not made from true fats and, in addition, they differ from the synthetic detergents on the market in having no salt forming groups. In the past, the more popular synthetic detergents—almost without exception—contained sulfur in the form of a true sulfonate or a sulfuric acid ester, and a few contained nitrogen. On the other hand, some of the more recent developments contain neither sulfur nor nitrogen. As an illustration may be mentioned the high molecular weight ethers of polyhydric alcohols. Some of the other recent developments, however, contain nitrogen and are amino compounds or quaternary ammonium salts.

Recent research on the aromatic sulfonates, which have long been known, has resulted in great improvements in this class of product. In this same connection, there has been considerable development work done on certain alkyl aromatic sulfonates, derived from cracked petroleum hydrocarbons. As an indication of the interest being shown in this work, during the 1938 American Chemical Society Meeting in Milwaukee, there were 15 papers read on the alkylation of aromatic compounds.

Work is also being done in the production of synthetic detergents along the lines of sulfated monoglycerides. While interesting, these products have the disadvantage of breaking down more readily in the presence of alkali than some of the other synthetic detergents, such as the fatty alcohol sulfates.

Another interesting disclosure is a patent which describes the use of solid sulfating agents in place of the customary liquid sulfating agents.

The tempo in the research for improved synthetic detergents constantly becomes faster and more furious. Within the next few years, it is possible that newer methods of manufacture may result in superior products selling at a lower price than those on the market today.

All in all, the past year has been an extremely busy one in the development of detergents.

*Textile Research Department, The Procter & Gamble Company.

Do Reciprocal Trade Agreements Help the Textile Industry?

ELVIN H. KILLHEFFER

THERE are now a total of 18* agreements completed with various nations and if there are beneficial results in anything like the volume visualized by the proponents of this trade policy, we should, by this time, be able to perceive the actual instances of benefits received.

When the program was first announced it was claimed that the program would be of great assistance to farmers, more especially it would open up foreign markets for American cotton. Discriminatory treatment was to be reduced or eliminated. Unfortunately, these objectives have not been realized. Likewise, there has been a failure to realize benefits in other directions, so much so that in the current propaganda, economic reasoning has been largely abandoned in the favor of an emotional appeal. The proponents say that increasing international trade is the sure road to peace. Two observations seem pertinent at this point. First, agriculture has not up to the present benefitted by the trade agreement program. Second, the trade treaty program has been in effect since 1934 and it would take a brave person indeed to assert that the world is more peaceful today than it was four years ago.

If the trade treaty program is sound we should be able to justify it on the basis of economic reasoning. If we must rely for support upon excitation of the emotions, then there must be something fundamentally wrong with the program itself.

We should admit at once that in the treaties made thus far there is evidence of careful study of the individual items dealt with. This is not to say that all the reductions made in duty rates were wise.

Individual changes in rates, no matter how damaging they may be to some particular producer, are nevertheless of less importance than are the implications of the program as a whole. Doubtless most concern is felt because those in authority do not seem to comprehend that we are in the United States following two broad policies which are diametrically opposed to each other.

On the one hand we are deliberately making this a higher cost nation. Wages are being increased, hours are being shortened, both being very desirable objectives. Huge governmental expenditures make constantly increasing taxes necessary. All of this is naturally reflected in the cost of everything we produce, whether it be a product of agriculture or industry. Then in the field of agriculture, the present authorities are doing their bit to hold prices at high levels. Those of us who are familiar with some of the farm situation, will agree that the farmer does not get enough of the consumer's dollar. This seems to be the result of too great a spread between what the farmer gets and what the consumer finally pays.

A study of this phase of the problem should be very helpful. Cotton continues to be the chief agricultural problem. Here the authorities made a choice apparently as between two theories. These were, first, the idea of reducing the cost of producing cotton so that growers could make a profit on the prevailing low price level or as alternative the increase of the price of cotton through artificial devices so that growers would realize a profit in this way.

The second method was followed and one of the artificial devices used to bolster the price was a restriction of the crop. But the artificially maintained prices made foreign sales even more difficult than before. Other nations having cheaper land and cheaper labor saw an opportunity and grasped it, so that more cotton is produced today in other countries of the world than ever before. This is foreign business which is permanently lost to the American farmer. Moreover, as surpluses piled up the Government itself had to make cash advances. All the losses involved are paid by the taxpayers so that again we have a factor increasing the cost of goods we produce here. Nor could Reciprocal Trade Treaties change this situation, for any possible gains were more than offset by the conditions already described. It is significant to note in passing that China, in the part now dominated by Japan, grew last year a number of bales substantially equal to the number we sold to Japan. Does anyone really think we will retain our cotton business with Japan?

All of this is pertinent to the American Textile Industry. Many students of the matter think that a choice of the first alternative would have been far wiser. After all, there are cotton growers in the United States, who have made a profit even when cotton sold at the lowest prices. If even one grower can do that, others can be shown how. If a concentrated effort were made, the results would probably be startling and highly pleasing.

Cotton is almost pure cellulose. This is important when we realize that we are just on the threshold of cellulose chemistry. Cotton then as a cellulose raw material will find expanded uses as it is available in larger quantities and at lower prices. That is the history of most raw materials. While the expanded uses do not come over night, they do come if we set the trend deliberately in that direc-

*Since writing the above, there has been signed an agreement with the United Kingdom and a new agreement with Canada.

tion, whereas we close the door against such development by moving toward higher costs and prices.

Here we see a pattern which has a profound bearing on the textile industry in the United States, particularly in connection with any consideration of the Reciprocal Trade Treaties. At the very time when all the forces increasing costs are set in motion, Mr. Hull persistently whittles away at tariffs which stand as a defense, not against the lower raw material costs of foreign nations, but against the lower wage and living standards of those nations.

Obviously, the Orient is uppermost in our minds for there the textile industry has taken firm root. This industry is said to be the largest employer of labor in the United States. Doubtless that fact makes it doubly attractive in the Orient where great populations are available. This great volume of labor, paid about 24c for 10 hours work, makes a differential in the cost of goods produced which it is impossible to overcome by any presently known normal method. The vain dreams of some, that greater efficiency of our workers discounts the difference in wages, is just so much nonsense. And when people here speak of coolie labor, they fall into a grave error. The very term implies a depressed and perhaps driven class. This is wide of the truth, for far from being depressed, these oriental workers who receive 24c a day, are in fact earning much more than ever before and are in consequence quite happy and satisfied.

In textiles as in most industries, the home market is by far the greatest in volume and importance. Unless the industry is to collapse gradually the home market must be preserved to it.

Even without any tariff reductions, the inroads of Japanese goods in the United States and the Philippines have been serious. Only the hopelessly naive have faith in gentlemen's agreements in the absence of complete agreement as to what that term means. Our faith in the sanctity of any such agreements is in fact completely shattered by current events in that part of the world.

Meantime, there have been a few reductions in our duties affecting textile goods in trade treaties already negotiated and further and perhaps much more far reaching cuts are predicted in the treaty now pending with Great Britain.*

Without laboring the point further, it is apparent that we are pursuing two diametrically opposed policies, raising our own costs on one hand and on the other, opening our markets to goods coming from low cost nations.

Cotton was discussed at some length but similar reasoning applies also to wool, although perhaps to a less degree.

There is another and important angle which should not be omitted from this discussion. Proponents of lower tariffs declare their intention to lower the duties which protect inefficient industries. True, they forget about efficiency when they talk about agriculture but not so with industry.

Important in any consideration of efficiency is the amount of research a given industry does in an effort to improve itself. In this respect the textile industry stands indicted, for its record is wretched.

The Textile Foundation is promoting research as well as improved educational facilities. The American Association of Textile Chemists and Colorists is a large and potent force in the same direction. It is an organization of the technical men of the industry who do a job for the industry which the industry should do for itself. The United States Institute for Textile Research is an organization in which the industry itself, through its units, holds membership. This is meant to be their own instrumentality for promoting and carrying on research.

It is significant that the first two organizations mentioned, who do the work for and without cost to the textile industry, are progressing, whereas the U. S. Institute, which looks to the industry itself for financial support, languishes.

*The trade treaty with the United Kingdom has now been signed and becomes effective January 1, 1939. There are many reduced duties on textile schedules. Doubtless the industry will make its own comments after it has had opportunity to examine the new rates. It must be remembered that these lowered rates do not apply only to the United Kingdom, for they are made available to all the world except Germany. This, of course, includes Japan, whose textile industry is modern and whose wage and living standards are entirely different than ours.

Chemistry of
Hydrocellulose and Oxycellulose

CHARLES GOLDTHWAIT

THESE interesting chemical materials are for ever cropping up where they are least wanted. They are not only a source of trouble if one's vigilance is relaxed when processing cellulose fibers, but one or the other of them is frequently a major difficulty in research on the development of new processes or new cellulose fiber products.

Probably the average mill chemist, like the present writer, has usually dismissed these degradation products of cellulose as indefinite mixtures, rather ill defined in their chemistry, and worthy of only such attention as is required to avoid them. However, there is a fairly definite chemistry of such products even though the products themselves are rather indefinite mixtures. This is shown

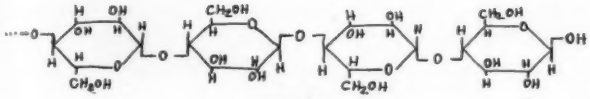

Fig. 1

particularly well for hydrolysis of cellulose because if this is carried on past the hydrocelluloses one can come out with nearly a one hundred per cent yield of glucose, a uniform and definite chemical compound. The case is not quite so clear with oxycellulose but it will be seen from the ensuing discussion that it, too, is a result of pretty definite chemical reactions.

There has been much research on these degradation products of cellulose and on methods of detecting and identifying them. Some of the research has been very detailed and highly scientific and would hardly seem worth while if it did not have a bearing on the structure and constitution of cellulose as well as on these nearly worthless degradation products.

Incidentally, these products do have a little more than a negative practical interest. The old sthenosizing process was supposed to produce some additional hydroxyl groups by a slight hydrolysis and then to build back a strong cellulose structure, modified but apparently without any of the effects of tendering. Also, the ageing of alkali cellulose for viscose rayon for a period of time before dissolving has an oxidizing as well as a swelling effect to adapt the cellulose to this particular purpose.

A short end section of a cellulose chain is shown with the commonly accepted structure, for convenient reference (Fig. 1). The end hydroxyl represents a reducing group at the end of the chain which reacts in a tautomeric form as an aldehyde.

The following notes are largely from several recent sources given at the end of the article.

HYDROCELLULOSE

The formation of hydrocellulose is evidently a fairly simple change to shorter cellulose chains. That is, hydrocellulose consists of chains which are essentially the same as those of cellulose but shorter and of varying length. While hydrocellulose proper consists of chains long enough to be insoluble, there are also very short chain soluble portions. There may be almost any degree of degradation.

Hydrocellulose has an increased reducing power from the development of reducing groups. It has low acidity as indicated by low absorption of methylene blue, unless acid has become fixed during its formation.

The oxygen between two glucose rings in a cellulose chain is hydrolyzed with a break in the chain and the appearance of two hydroxyl groups, one at each of the new ends, due to the addition of one molecule of water. Ordinary hydroxyl groups would not, however, produce the reducing effect. This is usually associated with aldehydes and is effective at only one side of the break in the chain.

Explanations here are usually rather hazy but one can

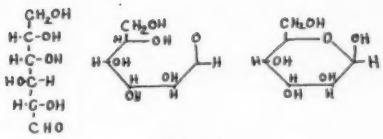

Fig. 2

reason from glucose. Figure 2 shows the structure of glucose in the open chain form, then twisted around to the ring form but not closed, and finally in the closed ring form where it does not have a free aldehyde group present as such. Glucose is mainly in the ring form and it has a strong reducing action even though it lacks the free aldehyde group. This is because the oxygen atom in the ring is an element of instability and a few of the molecules are present in the open chain form. The split occurs at the oxygen in the ring and gives an aldehyde group at one end of the chain and a hydroxyl at the other. This appears to be the general idea of the reducing group which looks like an alcohol but acts like an aldehyde.

Also, to account for some of the reducing action of glucose, and other sugars, there is "fragmentation" which takes place in strongly alkaline solution and increases the reducing power. In general, the latter can be taken as a measure of fragmentation.

The original cellulose has a reducing group at the end of each chain, or about one aldehyde group (actual or potential) to 200 glucose residues. Every chain to which it may be broken down also has a reducing group at one end. Glucose, the final product of degradation, breaks up in the usual strongly alkaline reducing solution until it shows about four times as much reduction of copper as would be brought about by one carbonyl (aldehyde) group.

We have thus accounted for loss of strength and increase in reducing capacity, although the weakening of the fiber may be caused partly by easier slippage of chains or micelles after some of the chains are broken.

The copper number of normal cellulose is very nearly zero (0.05 or less). That of completely tendered cellulose may be as low as 5. For the organic chemist this may seem to represent a low degree of hydrolysis because that resulting from complete hydrolysis to glucose is about 300. To the textile man the smaller amount is very serious hydrolysis because the strength has dropped to practically zero.

Observation in a standard manner of the fluidity of a solution of the material in cuprammonium reagent affords another method of measuring cellulose degradation. Since there are long, short and intermediate lengths of chains the fluidity is a function of the average chain length or of some other constant of the length distribution.

OXYCELLULOSE

While there is only one way to account for hydrocellulose, that is, by the hydrolysis of glucoside linkages

in long cellulose chains, there are several possibilities in the formation of oxycellulose.

Oxycellulose and hydrocellulose may be formed at the same time, but in the absence of acid hydrolysis, oxycellulose is characterized by a shortening of chain length and an increase in fluidity which must be accounted for in some other way.

First and most obvious of the ways of forming oxycellulose is the oxidation of the primary alcohol side chain, $—CH_2OH$, to an aldehyde group and ultimately to a carboxyl. Next is the oxidation of an aldehyde, or potential aldehyde end group of a chain to a carboxyl.

These changes, if proceeding through to carboxyl, do not increase the copper number, or would not if nothing else happened. Nor would they be a cause of weakening of cellulose fibers through the shortening of cellulose chains. The increases in acidity through the formation of carboxyl groups from either cause do, however, produce great increases in the amount of absorption of methylene blue. This accounts for one of the types of oxycellulose.

We know very well, however, that one of the first effects of oxidation is loss of strength. If the oxidizing influence is accompanied by strong acidity, as is often the case, there is hydrolysis and weakening from that source. However, there is weakening from breakdown of the chains when such hydrolysis is absent.

Cellulose is held together by a group of strong forces. There are primary bonds in the chains and secondary or still lesser bonds acting sidewise between chains, supposedly arising at the hydroxyl groups and possibly at other locations.

One of the theories of the shortening or breaking of the cellulose chains is based on the change in the balance of the forces in a glucose unit if an alcoholic group in it becomes oxidized to an aldehyde, ketone or carboxyl group. The polarity of the carbon atom to which it is attached will be changed. Then one of the glucosidal oxygen atoms will receive a positive charge and the other become negative, whereupon these atoms will react more readily with hydrogen and hydroxyl of water, and hydrolysis will be made easier. Then, in turn, there will be the usual development of reducing groups and higher copper numbers.

Another possible factor in the production of oxycellulose is the formation of ketone groups. Such could occur by oxidation at the moment of formation of hydroxyl groups by hydrolysis. While not the most important oxidation effect, this could explain or contribute to some of the results which have been observed.

Davidson now proposes a quite different mechanism as another possibility to account for at least a part of the formation of oxycellulose. Work on chemical substances somewhat similar to cellulose suggests that the following may take place. On one side of the glucose ring in a cellulose chain there are two adjoining carbon atoms each carrying a hydroxyl. These might oxidize to aldehyde groups accompanied by the opening of the ring at the bond between their carbon atoms, making a di-aldehyde.

The two aldehyde groups may then oxidize further to two carboxyl groups. At the first stage they would have high reducing value and copper number while at the second stage they would have high methylene blue absorption capacity.

Another step in the cellulose degradation consists of hydrolysis in the primary oxidation product, under conditions where there is no attack on unoxidized cellulose, but where the oxidized portion is more susceptible.

Such a process as the breaking of the glucose ring would seem to promote hydrolysis more readily than the oxidation of a side chain ($—CH_2OH$). This newly proposed mechanism does not exclude other oxidation reactions. However, under suitable conditions, there may be oxycellulose in which the secondary hydrolysis has not taken place and in which the tensile strength has not been so greatly reduced. Davidson also offers other data in support of his views.

It is, of course, entirely possible that oxidation under suitable conditions may produce simultaneous opening of the glucose ring and oxidation of the primary alcohol side chain.

There is one more important point. Acid oxidizing solutions form reducing oxycellulose while alkaline oxidation leads to the acidic type. During the first type of reaction carbon dioxide is given off, apparently by decarboxylation, and the methylene blue value may be low. However, in the presence of alkali the carboxyl groups form salts and are more stable. Hence there may be high methylene blue values. The writer has never tried it, but there may be a hint for trouble-shooting in this difference in characteristics of oxycelluloses of different origin, carefully made tests pointing toward some particular source rather than another. To confuse matters, however, there are also oxycelluloses such as produced by oxidation with hypochlorite at pH values very near the neutral point, whose properties fall between those of the two extreme types.

Thus, although we may have thought of the oxycellulose and hydrocellulose reactions merely as something that spoils the cotton (or rather cellulose), it has become clear through continued research that they are the results of definite chemical reactions although our knowledge about them is still more or less indefinite.

The main sources of information for this brief review are noted below and much additional interesting material will be found in them. Each has references to earlier material. The recent Organic Chemistry by L. J. Descha (McGraw-Hill) has a particularly good account of carbohydrates and their reducing properties.

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NOVEMBER 28, 1938

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Business Management

of Dyeing and Finishing Plants*

JEROME D. CHAKY**

FOREWORD

IN selecting the type of dyeing and finishing plant we have mostly considered the dyeing and finishing industry as a whole, not taking into consideration the manufacturing end of its such as weaving, etc. We have been governed by the desire to ponder the fact that most of our plants in this vicinity are of this type. This is especially true of the Paterson and New York districts and parts of New England and the South.

It is hoped that by doing so we are going to benefit mutually and be enabled to put into practice some of the new things you will hear in this talk or during the discussion which I hope will follow.

It is quite probable that many of our businesses suffer from lack of management more so than from lack of business.

Thorough knowledge and full understanding is re-

*Presented at meeting, New York Section, October 28, 1938.
**Superintendent of Amity Dyeing & Finishing Co., Inc.

quired from all business men who run an enterprise such as a dyeing and finishing plant, in order to produce profit for the owners.

A few years back, and even today, it became a by-word in the textile industry that business is terrible! Such a statement as this should never be taken at face value. The whole question seems to be very relative. It may be very terrible for one concern and yet acceptable to another. In nine times out of ten business is not materially but rather psychologically bad. The successful management of a textile plant depends on the right way of thinking. It will be our endeavor to illustrate, approximately, how a model plant should be run.

OFFICE MANAGEMENT

Many of you gentlemen who happen to be representatives of bigger or smaller corporations will agree with me that in most of the dyeing plants today there seems to be entirely lacking one of the cardinal and also most modern principles of business, "courtesy." One must wait endlessly and aimlessly until someone will ask "What do you want?" or "Who are you?" instead of "What can I do for you sir?" It does not make any difference to them that you might be a buyer or a prospective customer of theirs. The treatment is the same. Inevitably the big things are done in the same way as the little things.

Therefore, it should be a primary requirement that office management should be polite, quick, energetic, and efficient.

It should be able to answer questions and inquiries almost at once. The system should be Spartan in its simplicity. This would cut down bureaucratic red tape, delays, etc. In most of our establishments all business is conducted through the office. The office is the place where inquiries are made. There a man may meet another with whom he may or may not like to deal. The most important thing is the psychological effect. The appearance of the office and the treatment extended there, reflects the caliber of the business. It does not need expensive fittings. The atmosphere is also important. A well managed office, where courtesy is expressed, leaves one with the impression of a well going expertly handled establishment. You might even think that the dyer or finisher has never known what a headache or being cross means. It might appear that they have been brought up on honey and angel cake. A good impression made, often means a new customer or perhaps a better price. A well run office should at all times have a competent office head, having full charge, whose duty should be to see that everything is done properly and quickly in the best manner befitting a successful establishment.

HOW TO ARRIVE AT COSTS

It must be admitted however, that it would be impossible for any one man to handle all the details connected with a dye-house or finishing plant. Therefore, it is only logical for a concern to have a competent superintendent and department heads who are capable to run it with the utmost efficiency. It seems that the old days when a dyer or a finisher could be very successful only by working manually and taking charge of his little domain, are gone forever. A superintendent of today should absolutely have some knowledge of chemistry, dyeing, and finishing. He has to be a mechanic in order to understand and correct deficiencies in machines. He has to be able to devise short cuts in processing in order to increase production and yet improve the quality. He should be an excellent buyer, looking for quality and uniformity, of the product he buys. In one word, he should be a dyer, finisher, mechanic and a business man at the same time.

In the dyeing department, it is very important to produce the shades, especially the dark ones in the most economical manner. In the majority of the job-dyeing plants it has become a practice to check up on some, or on all the new shades that come in to be dyed. The cost of handling, figuring on the actual running time, and determining the cost of electricity all are essential. It is false, however, to assume that the cost of dyeing materials, such as dyestuff, will be the same at a given shade and quantity if two different dyers will dye it. Let us presume that there are certain fastness qualifications to the shade and two different dyers will dye the same shade on the goods having identical qualities and yardages. It will be quite a revelation to find how greatly the dyestuffs costs will differ in each instance. Yet we will have the same shade and approximately the same fastness. It would be quite a folly to mention all the important cases that came to light by simply observing others at their work. Let us illustrate a typical case. A lot of crepe made of acetate warp and viscose filling were dyed by two different dyers working in the same plant. One customer sent in about 300 yards of box crepe to be dyed for a popular red shade. One of the dyers proceeded to dye it with a bluish acetate red and a reddish acetate yellow. In the dyeing process he used 21 ounces of the red and 18½ oz. of the yellow. About a week later the firm received about 300 yds. more to be dyed the same shade. As it happened the other dyer got a hold of the batch and finished the lot by using 14 oz. acetate red and 14 oz. acetate scarlet.

Nothing seemed to happen for a while until the same customer sent in again the same shade and quantity to be dyed and this lot happened to go to the dyer who handled the first batch. He put this lot in a larger size box than was required and dyed it with about 26 oz. of acetate red and 23 oz. of acetate yellow. In all these three cases, the goods were of the same construction, coming from the same mill, to be dyed the same shade. The only difference was a slight variation of the yardage. On examination of the cost of these three dyeings we will find a great

difference in costs as far as dyeing materials are concerned.

Acetate Scarlet	$1.83 per lb.	
Acetate Red	2.85 per lb.	
Acetate Yellow	1.70 per lb.	
Lot A: 21 oz. of red equals		$3.73-8/10
18½ oz. of yellow		1.96-1/10
Total		5.69-9/10
Lot B. 14 oz. of red		2.49-2/10
14 oz. of scarlet		1.59-6/10
Total		4.08-8/10
Lot C: 26 oz. of red		4.62-8/10
23 oz. of yellow		2.43-8/10
Total		7.06-6/10

The dyestuff costs of the filling which in this case was viscose has not been considered. This one instance will show how economically one man works compared to the other. Therefore, it is very important, when determining the cost, one has to determine the capabilities of his own dyer.

There are other plants that strictly demand that all lots should be handled with the lowest amount of dyeing materials. It seems to some self-styled efficiency experts that in doing so they would save the firm some money. In some cases this is correct, but in most of them, it is not. It was experienced that, for instance, in dyeing black and other dark shades, it is cheaper to use more dye-stuff and running out the lot quicker, than to save the dyeing materials and arrive to the given shade in a longer time. This is especially true in Jig dyeing. It is noticed that a 1000 yd. roll could be dyed easily in four ends with a given amount of dyestuff, and in six ends by using about one pound of dyestuff less. On examining the cost of a roll it is noticed that a striking situation exists, which depends on the cost of labor. The cost of organized labor around the metropolitan section and its vicinity is 66 cents an hour minimum, one man running two Jigs.

The running time of one thousand yards of goods in one run, is 20 to 25 minutes, depending on the speed of the machine. The actual running time on 1000 yds. of black is 1 hour and 40 minutes. Dyeing the same lot by using one lb. less black at 30c per lb. and dyeing it 6 ends the actual running time is 2 hrs. 30 minutes not taking into consideration the time taken up in heating up the dye bath for the two extra ends. It is easily seen that the cost of labor alone offsets the dyestuff without even giving consideration to the fact that the electricity will be 1-3 higher, and there is also more steam used up. The biggest set-back, however, is the loss in production. The 50 minute difference in running time, could be used practically in dyeing another roll half way. In dyeing every two rolls by using a little more dyeing materials, that machine would produce three rolls with the same amount of electricity and labor that would have been used on two rolls before. It would mean an increase in production of 33 1-3 per cent. This picture might be reversed in a region where the labor and electricity, etc. is very cheap. Even so, the depreciation of the machinery will be quite offset by sane and scientific production. At any rate the difference in a year's production by one method against the other will be tremendous.

The speed in scouring and finishing; in fact in all processes will tend to change the cost of production. Therefore, it is necessary to devise short cuts mechanically and chemically at all times. One must be able to adapt oneself to the changing conditions. More than that, one must be able to create those changes. In other words, a plant that successfully originates a short cut in production, and, incidentally, a rise in production, will have the upper hand against less progressive plants.

Another important point often overlooked is the absorption speed of dye-stuffs at a given temperature. It is understood that certain dyestuffs have different affinities at different temperatures. Therefore, it is logically right to select dyestuffs that have the highest affinity at the temperature the goods have to be dyed. Goods dyed this way will require less dyestuff than would be ordinarily the case. All goods that come in a dye-house have certain allowances for shrinkages, depending on the quality of the material and the nature of the fiber. Any shrinkages above these allowances have to be made good by the dyeing concern or in manufacturing, it should be considered a working loss. It is of paramount importance to minimize shrinkages. The sole way of achieving this is to eliminate long handling in dyeing and finishing. Goods may lengthen in the Jig by applying higher tensions, but at the same time they get narrower, only to be pulled out in the finishing operations in order to get the proper width. It is only natural that fabrics handled this way will thin down considerably and will not have the proper hand beside lowering the count. In order to get the proper hand, it will require more finishing materials at an extra cost.

PURCHASING

Purchasing seems to be also one of the most difficult problems of all. It would be easier to expect the saying to be true that "If we have money we could get everything." "Everything" is a rather vague word after all. It could mean almost all things imaginable with only a few exceptions. At any rate it was all to the good in 1929 but today it appears to me that after the depression and the so-called recession in our industry the best manager will be neither "you" or "I," but the man who will be able to purchase almost everything with nothing at all.

Laughable as it seems, nevertheless it is true, and it is being done.

There are lots of firms only too eager to do business,

without future consequences either to themselves or to the purchaser.

In my long experience in this industry I have seen a great many examples how purchasing should not be done. I do not want to impose on your patience by a long dry description of the facts. I merely will cite one example, and, gentlemen, you can draw your own conclusions.

Years back a new concern that had been started sent his representative around to approach me about some finishing materials they were manufacturing at the time. Due to the fact that we had already been supplied with the identical thing by another house at the same price, I did not see any reason for buying this item from a different concern. After a while, however, they over-rode me and took up the matter with the owners. They secured the business. Credit had been extended just for no good reason at all for over sixty (60) days and over three thousand ($3000) dollars. In due time the gentlemen who over-rode me came to be rather ruffled up and sheepish. He was lamenting the fact that the account was way over due and much too high for comfort. He complained bitterly that every time he received an order for three hundred ($300) dollars, we paid him the small sum of one hundred and fifty ($150) dollars on the old account. Therefore, the total sum instead of being stagnant or decreasing to a sane level, reached above the proportion of business sanity. He also added that he did not know why in Mohamed's name he should be giving so much credit. He claimed that we had nothing at all to show financially. For once I had to get even with this gentleman. I told him that it seemed to me that we had one of the greatest assets in the world, "BRAINS." We must have it if we were able to buy something for nothing. "Well, I have learned my lesson," he said, and my retort was, "If you think you have graduated, you are entitled to some Degrees. The first degree you will receive is an M.D."

If you will continue to give us credit, we will make you a D.D. If you still continue to grant us credit, we will make you a Ph.D. Some day you will close your business and you will positively retire as a Ph.D. He could not understand the titles and degrees, so I had to enlighten him that his case being extraordinary, we have to interpret his titles in an extraordinary way too—so M.D. means, "moderately dumb"—D.D. is decidedly dumb, and Ph.D. is "phenomenally dumb." Above all, if he does not learn, he could file bankruptcy and retire as Ph.D.

Many owners of textile plants do not even have an inclination as how to handle a selling representative.

The first question they usually ask from the approaching representative or salesman is the price even before he has the chance to say anything about the merit of his product. It seems that most people readily buy anything at a price providing it is cheaper than the one they had paid before. This whole procedure is all wrong. The price should never be asked at all. Instead the product should be carefully examined—not only chemically, but tried in practice also. There have been many products on the market, especially the ones used in finishing processes that showed practically the same composition but in practice they proved to be inferior. This is mostly due to manufacturing processes. It is not intended to be said that we should buy only high-priced products, but it means that after renewed experiments and trials if the product is satisfactory, we should ask the representative, with the best poker face turned on, "What is the lowest price you can sell it for?" Then it is possible to buy it with a price low enough to fit the concern's pocket and produce goods at the lowest expense with profit. It is advisable to buy dyestuffs from only reliable concerns and not to try to pick from among the hundreds of different dyes the cheapest ones we could. Test these dyes, not only for money value as it is customarily practiced, but the penetrating properties, absorption, speed, their reaction and level dyeing properties, on poorly woven goods. Fastness, brilliancy and solubility should be taken into proper consideration. This way it is possible to do away with all spots, uneven dyeings, blotches, oxidized edges and other defects. In other words, there will be no re-dyes.

Uniformity plays a very important part in textile finishes. It is of the utmost importance that each batch received should be alike, not only chemically, but also in its working properties. This naturally will require a more careful and more exacting method of manufacture and it is to be expected that it will cost slightly more. Uniform products of this type will produce uniform finishes if properly handled, and will satisfy the owners of the plant by not having any refinishing to contend with. It is a good policy to take advantage of discounts and contract all materials used in the plant. It is not a healthy proposition to be able to receive unlimited credit from any concern. It tends to slacken the watchfulness, of everyone from owners down. Smaller credits, with average time limit, will arouse watchfulness and careful calculation on the part of the management. This way there is a continuous check-up on costs.

I would like to call the gentlemen's attention from the various Credit Departments to the fact that some of them forgot their first lesson in business. As explained previously, we will try to back up the statement with another example. A little boy, ten years old, asked his father, a successful merchant, to teach him the business. The father declined on account of the boy's age, but promised to give him his first, and most important lesson, on his fourteenth birthday. The boy could hardly wait. However, the great day dawned. His father took him up into the attic and asked him to bend over and look down upon the street through the window. This done, he took a board, he whacked him good and hard on his Southern exposure. The boy jumped up rubbing hard that part of his anatomy. He demanded to know from his father what this had to do with the business. He said, "Well, this is the most important lesson, and the first lesson of all businesses. It

will teach you that in business you cannot even trust your own father." I hope there are no hard feelings, but do you catch on gentlemen, to how some Credit Departments operate?

PRODUCTION AND EQUIPMENT

To arrive to the highest point and quality of production it is necessary to have first class up-to-date equipment.

The trend today is towards higher speed machines that are more fool proof, more automatic, turning out a higher quality and quantity of goods, with less labor.

It is only natural that concerns which are in a position of being able to scrap out-moded equipment and install new ones will be able to turn out higher quality merchandise at a lower price, and still make a profit.

It is quite practicable to have a modern machine of a certain type where two and at times, three different operations are carried out simultaneously at a higher speed than ever before. In these instances the saving is, in salaries and in increased production. Besides, it is quite practicable to cut some operations out altogether which means another short cut in production.

ELIMINATION OF WASTE

In dyeing it often happens that the wrong shades are dyed or shades are dyed too dark, necessitating the use of stripping agents. Using excessive amounts of chemicals in the various dyeing and scouring operations, such as boiling off, neutralizing, bleaching, and excessive rinsing constitutes a waste of materials.

In finishing it often occurs that materials are not finished properly. They often do not come up to expectations. They are either too soft or too stiff. They lack luster or they are too lustrous, all of which means refinishing, reframing, palmering, and calendering operations. In many other instances the finish has to be washed out entirely, which holds back the dyeing department and new finish has to be applied.

It has been noticed in many of the dyeing and finishing plants that materials and tools have not been put into the reach of the help. Therefore, considerable time and efficiency is lost due to the fact that help has to spend time in walking various distances. It is essential, therefore, to place everything that is used in the course of the day, as near as possible to the individual needing same.

There are hundreds of other wasteful instances, too numerous to mention.

TREATMENT OF LABOR

There are many points open to discussion with reference to decisions as to how a man should be treated in general and Labor in particular. There are still a few people left who are mentally living in the 18th century and even before. There are also some workers who live mentally much ahead of the times. It should be, therefore, conceded that treatment of labor should conform with the policy best suited to our present democratic times. It must be admitted that there are some concerns that would love to handle labor with the old fashioned iron hand. I, personally, do not believe in this. Neither do I believe in irresponsible labor leadership and the so-called wildcat strikes. A contract is only a contract if it binds both parties equally. It gives both parties the same privileges and the same freedom, above all, if it makes both parties the same privileges and the same freedom, above all, if it makes both parties equally responsible. In other words, should a firm break its contract with the Union that firm must be financially liable. Under present circumstances this is true, regarding corporations, but, unfortunately, this is not true of Labor.

It also should be the duty of the management to try faithfully to educate and also to elevate the mental standard of its men. It is a fair and democratic proposition both ways. A worker, directly due to his better training, has better knowledge. Therefore, he is in circumstances furthering his own material advancement by receiving better wages. The corporation in return will have a higher production with a better quality.

There are many instances when a prolonged continuous teaching of a man on a certain machine proves to be a failure.

That man has no inclination whatsoever to the type of work he is employed at. Therefore, it is only a waste of time to try to drill something into him that he will never learn.

An intelligent manager should foresee a man's capabilities in a particular job very shortly. Should the man be disinclined to that particular job he should assign him to another type of machine or another type of work. That man may prove to be an excellent operator in his new assignment whereas he was a failure in the old one. Most of our mills do not seem to follow these policies. The customary thing is to scold the man and send him away for good. It is realized very infrequently that such a man might have spent three or four days in a plant and not have any real knowledge of the work, yet he might be inclined toward that particular type of work. Sending him home and hiring a new greenhorn would not help matters at all, and you will have a man with no experience at all.

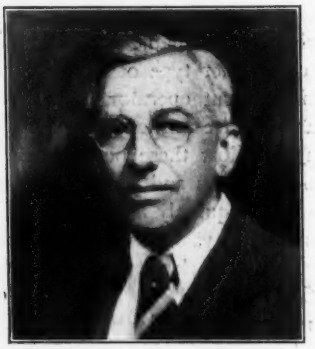
Intelligent labor could be treated very amicably, yet wouldn't try to take advantage of their superiors. Such intelligent labor, treated democratically and fairly, will work more conscientiously, will produce better quality of merchandise than labor that has been constantly nagged. A foreman must know the habits and tendencies of each man and treat each psychologically. All promises to labor should be kept, or else not given. Labor should understand that a higher profit in any concern will mean higher wages for labor. And an operating loss will mean probably a loss of positions.

There are, however, occasions when labor becomes unruly and unmanageable, due to various reasons. There-

(Continued on page P705)

ALBAN EAVENSON
President

ARTHUR R. THOMPSON, JR.
Vice-President



HAROLD C. CHAPIN
Secretary

CARL Z. DRAVES
Chairman, Technical Program Committee

ANNUAL MEETING

ATLANTA, GA.

Program

FRIDAY, DECEMBER 2

10:00 A. M. Registration Opens in North Foyer of Atlanta Biltmore Hotel.

10:00 A. M. One hundred and twentieth Council Meeting.

11:00 A. M. One hundred and thirteenth Meeting of Research Committee.

12:30 P. M. Luncheon in Georgian Ball Room for all Members.

Official Opening of the Convention.

Presiding: ALLEN JONES, *Vice-Chairman Southeastern Section.*

Speakers: HON. THEODORE M. FORBES, Executive Secretary, *Cotton Manufacturers' Association of Georgia.*

HON. E. D. RIVERS, *Governor of Georgia.*

HUGH M. COMER, *Vice-President and General Manager of Avondale Mills:* "A Mill Executive's Viewpoint on Dyeing and Finishing."

Music by School Orchestra from Avondale Mills.

12:30 P. M. Complimentary Luncheon for Visiting Ladies, followed by Bridge and other Entertainment.

2:30 P. M. First Technical Session in Pompeian Room. "The Research Program of the Textile Foundation at the National Bureau of Standards" by DR. MILTON HARRIS, Director of Research for *Textile Foundation Research Associateship.*

2:55 P. M. "Methods for Increasing the Consumption of Cotton" by DR. A. R. MACORMAC and DR. C. A. BASORE of the *Alabama Polytechnic Institute.*

3:20 P. M. "The Testing of Textile Fabrics" by ROBERT H. ADAMS of the *Callaway Mills.*

3:50 P. M. "The A. A. T. C. & C. Official Method for the Evaluation of Wetting Agents" by DR. CARL Z. DRAVES of the *Ludlow Mfg. & Sales Co.*

4:20 P. M. "The Dyeing of Naphtols on Cotton Piece Goods by the Continuous Hot Flue Method" by SUMNER H. WILLIAMS of the *General Dyestuff Corporation.*

5:00 P. M. ANNUAL BUSINESS MEETING in Pompeian Room.

Under Auspices:

Southeastern Section

AND CONVENTION

DECEMBER 2 and 3

7:00 P. M. Buffet Supper for Members and Visiting Ladies in Georgian Ball Room.

Presiding: P. G. WEAR, *Chairman Entertainment Committee.*
Moving Picture: "Destiny of Dixie."

Entertainment staged by GRAHAM JACKSON, and followed by Dancing.

SATURDAY, DECEMBER 3

9:30 A. M. "Flax—Its Agricultural and Industrial Possibilities" by C. G. WORTHINGTON, Research Fellow at the *State Engineering Expt. Sta.*, Atlanta, Ga.

10:05 A. M. "Modern Package Dyeing Equipment" by THOMAS R. SMITH of *Wiscassett Mills* with Motion Picture presented by W. A. WOLHAR of the *Rosemary Mfg. Co.*

10:40 A. M. "Your Student Section at North Carolina State College and its "Problems" by PROFESSOR ALBERT H. GRIMSHAW.

10:55 A. M. "Screen Printing" by RALPH D. GREENE of *The Calco Chemical Co.*

11:30 A. M. "Some Fundamental Differences in Printing with Pigments" by HENRY L. YOUNG of the *Aridye Corporation.*

12:05 P. M. TO 12:30 P. M. "The Role of Starch in Textiles" by JAMES W. STALLINGS of *Stein, Hall & Co.*

12:45 P. M. Luncheon for Sectional Officers Only.

2:00 P. M. Complimentary Sight-seeing Trips to Cyclorama, Federal Penitentiary and about the City.

2:00 P. M. Golf Tournament with Prizes.

6:15 P. M. Reception at Atlanta Athletic Club. Free Bus Service.

7:00 P. M. BANQUET at Atlanta Athletic Club, followed by Dancing (Dress Optional).

Toastmaster: ROBERT W. PHILIP, *Chairman of Southeastern Section.*

Speakers: ARTHUR R. THOMPSON, JR., *Vice-President of the Association.*

PROFESSOR LOUIS A. OLNEY, *President Emeritus and Chairman of the Research Committee of the Association.*

ALBAN EAVENSON, *President of the Association.*

SENATOR WALTER F. GEORGE, *Senior U. S. Senator from Georgia.*

Headquarters:

Atlanta-Biltmore Hotel

LOUIS A. OLNEY
President Emeritus
Chairman of Research Committee

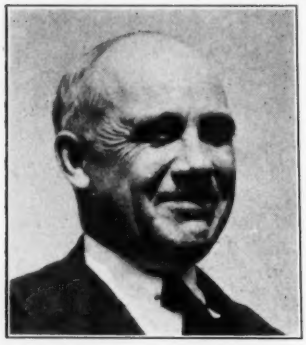
DUNCAN FERGUSON
Vice-President

WM. R. MOORHOUSE
Treasurer

ROBERT W. PHILIP
Chairman, Southeastern Section
Chairman, General Convention Committee

LOCAL COMMITTEES

EIGHTEENTH ANNUAL MEETING, DECEMBER 2 and 3, ATLANTA, GA.



GEORGE H. SMALL
Chairman, Reservation and Registration Committee

W. B. GRIFFIN
Chairman, Exhibit and Souvenirs Committee

ALLEN JONES
Vice-Chairman, General Convention Committee.

General Convention Committee

Chairman, Robert W. Philip, "Cotton"; Vice-Chairman, Allen Jones, Muscogee Mfg. Co.

Reception Committee

Chairman, J. C. Robertson, R & H Chemicals Dept., duPont Co.; E. A. Feimster, Eagle & Phenix Mills; W. F. Crayton, Dyestuffs Division, duPont Co.; C. M. Stodghill, Stodghill & Co.; Paul B. Seydel, Seydel, Woolley Co.; John F. Nation, J. M. Tull Co.; G. E. Missbach, Mathieson Alkali Works; James S. Bonner, M. Hohenberg Cotton Co.; Hans A. Blum, Paper Makers Chemical Co.; Earl Arthurs, Solvay Sales Co.; Geo. H. Coates.

Reservation and Registration Committee

Chairman, George H. Small, National Oil Products Co.; John W. Ross, Carbide & Carbon Chemicals Corp.; Ralph E. Howell, Frank G. North, Inc.; Lee L. Baker, Detergent Products Corp.; C. G. Stover, Corn Products Sales Co.; R. C. Cochrane, R & H Chemicals Dept., duPont Co.

Banquet Committee

Chairman, A. K. Haynes, Rohm & Haas; R. A. Field, Jr., Newnan Cotton Mills; James I. White, National Aniline & Chemical Co.; M. A. Land, Westinghouse Co.; L. A. Dillon, A. E. Staley Co.; M. T. Johnson, Callaway Mills; W. H. Randolph, Jr., A. E. Staley Co.

J. C. ROBERTSON
Chairman, Reception Committee

Exhibit and Souvenirs Committee

Chairman, W. B. Griffin, Kali Mfg. Co.; J. Hudson Almand, Penick & Ford, Ltd.; Jos. F. Oliver, Stodghill & Co., H. Gillespie Smith, Calco Chemical Co.; Wallace Hamilton; Sam R. Clement, Monsanto Chemical Co.

Publicity and Printing Committee

Chairman, Earle Mauldin, "Textile World"; Richard P. Smith, "Cotton"; E. H. Driver, American Cyanamid Co.; W. L. Johnson, American Moistening Co.; S. I. Parker, Ciba Co., Inc.

Entertainment and Transportation Committee

Chairman, P. G. Wear, Penick & Ford, Ltd.; John C. Turner, Charles Bond Co.; E. M. G. Schroder, General Dyestuff Corp.; James J. Reilly, E. F. Houghton & Co.; C. Russell Gill, Southern Sizing Co; George L. Dozier, Sandoz Chemical Works; Vasser Woolley, Jr., Seydel, Woolley Co.; C. Robert Mitchell, J. E. Rhoads & Sons.

Ladies' Committee

Chairman, Mrs. James Ivey White; Mrs. Sam R. Clement, Mrs. C. Russell Gill, Mrs. A. Kempton Haynes, Mrs. W. H. Randolph, Jr., Mrs. W. H. Randolph, III, Mrs. George H. Small, Mrs. John C. Turner, Mrs. Paul G. Wear, Mrs. William B. Griffin.

A. K. HAYNES
Chairman, Banquet Committee

P. G. WEAR
Chairman, Entertainment and Transportation Committee

EARLE MAULDIN
Chairman, Publicity and Printing Committee

MRS. JAMES IVEY WHITE
Chairman, Ladies' Committee

Abstracts of Papers to be presented at Technical Sessions

EIGHTEENTH ANNUAL MEETING
December 2 and 3, Atlanta, Ga.

The Testing of Textile Fabrics

ROBERT H. ADAMS
Calloway Mills

THE three principal elements which affect the testing of textile fabrics are considered; namely, the human element, mechanical factors and atmospheric conditions.

Some Fundamental Differences in Printing With Pigments

HENRY L. YOUNG
Aridye Corporation

SUCCESSFUL printing with pigments necessitates reduction of pigment particles to almost molecular proportions. These ultra small particles must be incorporated in the proper vehicle so as to cover the individual fibers and give maximum tinctorial strength and minimum crocking. The vehicle must form a bond with the fibers which is undisturbed by water, alkaline soaps, dry cleaning solvents, and mechanical action.

Because the final color particle is deposited on the fabric instead of being developed there by means of a chemical reaction, pigment printing entails certain beneficial alterations in application and after-treatment. Color mixing and matching is simplified because a preliminary test can be made with a finger spot and a patch can be pulled in the final shade. This also assures positive con trol at all times during printing.

A vehicle designed specifically for printing on cloth will have a lower surface tension than the usual pastes in order to obtain rapid wetting of the fibers and quantitative filling and emptying of the pores of the engraving. In this way the sharpness of mark is increased and there is complete fidelity in reproduction. This can be accomplished with less set and greater machine speed.

After-treatment is reduced to a rapid drying or heating to expel volatiles and to set the binder. Variations in color strength are eliminated because the color does not have to be developed by chemical reaction which depends on variables of temperature, concentration, and time.

Among the other advantages of pigment printing is a greater safety factor in pre-treatment. Incomplete removal of sizing in boiling and bleaching does not interfere with fixation of pigments as it does with water pastes.

Though many problems are yet to be solved, the economic and technical advantages of pigment printing have already brought about its widespread use.

Your Student Section at North Carolina State College and Its Problems

PROF. ALBERT H. GRIMSHAW
North Carolina State College

The Student: His high school preparation and his color vision in relation to courses in textile chemistry and dyeing.

The Curriculum: Balance between theoretical and practical experience; bringing the mill to the student; introducing the student to the technical journals and to technical literature.

The Graduate: Placement of the graduate; relation of the graduate to his college; experience of the graduate as a guide in changing the undergraduate curriculum.

Research Program of the Textile Foundation At the National Bureau of Standards

DR. MILTON HARRIS
Director of Research for Textile Foundation Research Associateship at National Bureau of Standards

THE aim of the new research program of the Textile Foundation at the National Bureau of Standards is to obtain fundamental data on the chemical and physical chemical properties of textile fibers. It is intended that such data will form a background for the study of many of the problems in textile processing.

The work which is being undertaken is divided into cellulosic fiber investigations dealing with cotton and rayon and protein fiber investigations dealing with silk and wool. The following investigations are now in progress: a study of the acidic and basic properties of silk, wool, and cellulosic fibers, the polyuronides in cellulose and their relation to fiber structure, the effect of oxidizing agents on cellulose, the cell structure of wool, the effect of oxidizing and reducing agents on wool, a study of the reactive groups in silk, the electrophoretic properties of textile fibers, and a microscopic study of the structure of the fibers.

A brief discussion of these projects and their relation to practical processing problems will be presented.

Possible Methods for Decreasing the Consumption of Cotton

DR. A. R. MACORMAC and DR. C. A. BASORE
Alabama Polytechnic Institute

SO far the efforts made to solve the economic problems of the cotton industry have been along the line of restricted production. The results have not been entirely successful. We feel that a much more promising solution of this problem would result from a coordinated program of technical research aimed at the development of new uses for cotton and cottonseed products.

Cotton is usd in two fields, as a fiber in the textile industry and, as a source of alpha cellulose in the paper pulp and rayon industries. In the textile industry it has the advantage of cheapness over linen, wool, silk and rayon, so that there is ample field for use of relatively costly processing methods to make cotton a competitor of the other fibers.

The second field for the development of new uses of cotton is in the use of cotton, linters or the whole cotton plant, as a source of cellulose pulps.

The third possible field for research is in the development of uses for by-products of the cotton industry such as seeds, hulls, stalks, oil, etc.

Thus three classes of problems suggest themselves:

(1) Changes in the physical and chemical properties of cotton whereby the cotton may become a serious competitor of linen, wool and silk.

(2) Development of a luster or finish on cotton comparable with or superior to rayon.

(3) Intensive utilization of linters, stalks, seeds and hulls in the chemical industry.

The Role of Starch in Textiles

JAMES W. STALLINGS
Stein, Hall & Co.

A description of starches and starch products. Proper selection and application in finishing and printing.

The Dyeing of Naphtols on Cotton Piece Goods by the Continuous Hot Flue Method

S. H. WILLIAMS
General Dyestuff Corporation

AS the mechanical set-up in dyeing Naphtols is as important as the chemistry of dyeing, we hope in this paper to bring out the important factors governing the control of this process by the use of new, improved equipment that has been developed up to the present time.

The four major factors governing the control of this process are as follows:

No. 1. Padding operation.
No. 2. The proper drying of the Naphtolated material.
No. 3. The control of the developing liquors.
No. 4. The after-treatment.

By combining the most suitable color combinations on up-to-date machinery, improved Naphtol dyeings are now produced that are far superior to work that has been done in this field a few years back.

Flax—Its Agricultural and Industrial Possibilities

C. G. WORTHINGTON
Research Fellow, State Engineering Experiment Station, Atlanta, Ga.

FLAX was the principal fiber crop of Colonial America, but cheap cotton has practically destroyed its production in this country. The great importations of flax seed, fiber and fabric today coupled with the threat of war in Europe that might cut off our present supplies seem to justify the expansion of flax production in this country. For the past three years the Tennessee Valley Authority in cooperation with the Georgia State Agricultural and Engineering Experiment Stations have been studying the possibility of adapting flax to the farming of the state and to the cotton textile, cottonseed oil and paper industries.

There is a substantial market for domestic flax fiber in the mixed fiber fabrics now being produced in increasing quantities by the cotton textile mills. The fiber must, however, be made available in a "cottonized" form and at an attractive price. The problem of developing a low cost method of processing the fiber and utilizing it on cotton machinery has been under investigation at the Engineering Experiment Station.

New mechanical and chemical methods are being tried on a pilot plant scale. The fiber bundles are first extracted from the straw by mechanical decortication after artificial drying. They are then subjected to chemical treatment under pressure to remove the gums binding the individual fibers together and to digest any wooly material present. Further mechanical treatment puts the fiber in condition for spinning on the regular cotton system. Mixtures of cotton with the "cottonized" flax improves its spinning quality and the strength of the resulting yarns. Stapled rayon may also be combined to advantage. Toweling, summer suitings, draperies, upholstery fabrics, and table cloths have been produced. It is too early yet to say what costs of processing and utilization will be on a commercial scale.

The A.A.T.C.C. Official Method for the Evaluation of Wetting Agents

DR. CARL Z. DRAVES
Ludlow Mfg. & Sales Co.

The convenience and accuracy of the official method in comparison with the canvas disc method. The adaptation of the official method given in the 1938 Year Book for use with very dilute solutions of wetting agents.

Modern Package Dyeing Equipment

THOMAS R. SMITH
Wiscassett Mills Co., Albemarle, N. C.
With Moving Pictures by:—
W. A. WOLHAR
Rosemary Mfg. Co., Roanoke Rapids, N. C.

A DESCRIPTION of up-to-date package dyeing equipment for cotton yarn, both mercerized and unmercerized and the important features of the machinery which must be considered to insure efficient operation and a superior quality of dyeing.

The uniform winding of the yarn both as to size and density, the metal used in the construction of the machine, the pump, controlled temperature and many other points will be discussed.

A comparison of the different types of extraction and drying that are now in vogue and an attempt to point out the advantages and disadvantages of each.

The economy of using nickel alloy metals eliminating rust and making brighter shades possible. Also the increased production that is accomplished through the employment of these improved metals.

Screen Printing

RALPH D. GREENE
Calco Chemical Co.

This paper discusses various methods of screen printing including the hand method, the resist or wash out method, the photographic method and the equipment used.

Business Management

(Continued from page P699)

fore, it is essential that those things should be remedied at once. One cannot run a plant efficiently without a semblance of discipline. Lack of this, sabotage, unreasonable demands tend to close a plant for good or drive business elsewhere. When this happens someone will lose thereby, and this will include labor. It is essential that the unions themselves should be able to keep faith and discipline at all costs, at least until the end of their contract. All grievances of either side should be ironed out before signing the new one.

If the existing conditions are weighed and found wanting there must be created a new spirit of good fellowship that will successfully change such conditions.

MAINTAINING QUALITY

There has been, and I am sorry to say, there still is, a tendency to cut prices not through better management and elimination or reduction of waste, not through any system of production by latest, speediest methods, but exclusively through lowering the quality of merchandise. I distinctly remember that in one of my articles, which I believe appeared in the Melliand I have mentioned the remarkable progress made in manufacturing synthetic fibers. Advancement and consumption of these fibers rose in leaps and bounds and we have honestly wondered how high the top would be, until the depression set in. Then quality seemed to vanish gradually, little by little, not so much in the yarn itself, but in the woven cloth. The first ones to be affected were, naturally and logically, the cheaper types. One has often wondered where this would end. Operators of machines were complaining that it is impossible to run this merchandise. Day by day it grew gradually worse. The cloth manufactured by commission weavers was almost impossible to handle.

Right along, step by step, the dyeings and finishings were cheapened to the nth degree. So much so that many firms soon found themselves out of business altogether. It is conceded, however, that there may be a market for lower priced goods to meet the pocket of certain people, but we must remember that there is a limit beyond which this practice should not be tolerated. It is understood that within certain limitations a lowering of the quality may be useful in the opening up of newer fields and bringing such merchandise within the reach of those who heretofore could not afford it.

Outside of this instance all lowering of qualities should be avoided at all costs, for, this action might make us lose the existing demand for that particular merchandise. In fact its consumption may cease altogether. All lowering of prices, therefore, should be made at the expense of management, systematizing, but never by letting down the quality by visible or invisible means. Invisible means —such as inferior dyestuffs, inferior finishes, lower tensile strength, etc. Visible means—such as appearance. It is also possible to keep up price and quality by maintaining customers' satisfaction.

Gentlemen I think this is the toughest of all propositions. I have known customers in my time that no one could keep contented, not even the red headed, blue-eyed office wife. Nevertheless, we could make a serious endeavor by doing little favors at all hours and mainly by giving them prompt, courteous service and timely deliveries.

I clearly recall an incident that occurred one day. One of our customers called me on the phone. He asked me about some bales of goods to be dyed. He requested me to deliver his six bales of goods back to his place undyed. I told him I would find out about them and let him know and asked if he could hold the wire a moment. He said he would. While on my way out I could not help but wonder why in tarnation he should call me up for bales. I had nothing to do with them. After a few minutes of looking around in the stock corner, not room, just a plain corner of the beaming room, I found all six intact. I went back to the phone and I told him I would try to see that he gets them next morning. Then the catastrophe happened. For a minute I thought I got into the barracks of the United States marines. What language! What profanity! Well, I was in the navy too but for nineteen years I have not been out on the ocean. With him on the other end of the wire I was surely at sea. He asked me, not too tenderly, through what country did we route his bales, "Maybe you have sent them through Jerusalem," he roared. Well, we are all human, and by this time I had reached to open my collar button. I had become a little too hot under the collar too. In extra plain English I told him a few things about geography, mentioning his neglected education. I informed the gentleman that I never laid eyes on a seagoing truck yet, and if he did, he should send one around as we might use it to deliver his six bales via Yokohama to his place on 4th Avenue, New York City. He retorted, saying, "You people need more than a seagoing truck to keep you floating if you keep running your business this way." The next day he received his bales promptly. I was two hours too early in the morning waiting at the plant for the truck drivers to come in. At 10 A.M., I received a phone from my caller of the previous day. He apologized for the way he acted. It developed that four days before he called he was told that the bales were on the truck and would

be at his place in a few minutes. It seems that the person in charge of deliveries had the regular habit of giving false promises most of the time.

Gentlemen, please remember that a man 10,000 times true to his word is merely O.K., but once a liar he is always a liar.

Therefore keep your promise at all times. If you see that you cannot, notify your customer at once explaining to him the difficulties encountered. I am sure he will be human enough to understand.

THE EFFECT OF OUTSIDE INFLUENCE IN BUSINESS

It is our belief that successful management of Textile Plants or all Plants connected with this great industry of ours will greatly depend on a few more sources. Let us examine these sources.

It might have occurred to you at one time or another that it is a rather easy matter to enter, for instance the commission dyeing industry. All that is required is for one to put up a small amount of cash and you get all the reconditioned machinery to put up a plant two blocks long. It is natural that this machinery is bought on the mortgage basis, with monthly or quarterly payments. Mortgage your soul, if you have any, and you are in business. The next thing, you have the plant fixed and the machinery, electricity, and plumbing, etc. installed on the same basis as the machinery was purchased. Assuming that you had some experience in the line, you make sure that your partner, who did not, will supply most of the money.

Here gentlemen, we have the dyehouse built and ready for operation with less money than you imagine. You could get all the goods to be dyed. Just tell the converters that you are ⅛ or ¼ of a cent lower in price than the nearest competitor. If you are half-way prompt, and do not spoil the merchandise, you can run at full blast, until the others meet your price. After that you again have to lower yours and you will be on top of the world for a few months again. But you will gradually notice that the ledger is a little out of balance. Even after some maneuvering, the condition soon becomes hopeless, the only thing left is bankruptcy, which is only natural, under the circumstances. All the legitimate competitors of the closed plant will put up a celebration that rivals New Year's day. This celebration, however, as all celebrations, comes to an untimely end, for in a few days or weeks you will read the announcement that the two or three partners who run the now defunct so and so Dyeing Company will open a business of the same kind and caliber for themselves, but this time individually, which means that against one competitor as in the past you will now have three. This reminds me of a cell or a starfish. In trying to save the oyster beds from starfish it was customary to cut up these starfish only to find that the limb they cut off grew a new body.

Many of our plants thus put up, suffer from over-expansion. They have too much machinery to pay mortgage on. Therefore, they cannot afford to have their machines stand idle during slack periods. Naturally they resort to price cutting. Unfortunately they are unable to regain this cut when the busy season comes along again. It is advisable, therefore, that all sales of textile machinery after a certain age should be stopped. It should never occur that some machine sold and regained by the manufacturer should bring more in total than the original sales value.

It is also seriously proposed that manufacturers should get together and buy up these old type machines from perhaps a common pool. There is a strongly rising sun of self-sufficiency and modern industrialism in South America and also in some presently backward countries, where these machines would be a blessing. To them it would be the entering of an era of new industrialism and the making of unskilled labor into skilled labor at the small expense of our second hand machinery sold to them at low prices. It is up to us to make this industry the pride of our country where the wheels are turning full speed supplying useful and beautiful textiles to our population.

It is up to all of us that this industry should not suffer the fate of the trucking industry. It is a well known fact that the only trucking that pays good dividends is the one done in Harlem in the Cotton Club. Today anyone can buy a few second hand trucks and he is in the trucking business. There are some of them running wild on our streets that are a menace to life and limb and should be in the junk pile.

It is the same with our own industry. We are the ones that build it, run it, and manage it. Let us resolve that we are going to run it in a way that we should be proud of. When our jobs are passed to the new generation, that generation should feel jubilant over a job well done.

And it must be emphasized again that our belief is that there are many more and quite different factors that, due to lack of time, I had no chance to discuss in this paper. However, we feel that enough has been mentioned to give us some of the fundamental principles of proper mill management.

CALENDAR OF COMING EVENTS

Meeting, Philadelphia Section, Penn Athletic Club, Philadelphia, Pa., December 9, 1938.

Meeting, New York Section, Chemists' Club, New York, N. Y. January 27, 1939.

* * *

Annual Meeting and Convention, Atlanta, Ga., December 2 and 3, 1938.

Annual Processing Review Number

AMERICAN
DYESTUFF
REPORTER

A. P. HOWES
Publisher

LOUIS A. OLNEY, Sc.D.
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MYRON DREW REESER
Advertising Manager

Published biweekly by
HOWES PUBLISHING CO., INC.
440 Fourth Avenue, New York City

Subscription price: $5.00 per year. Canadian, $6.00; foreign, $6.00

Vol. 27 November 28, 1938 No. 24

Greetings

to the

Members and Guests

of the

American Association of Textile Chemists and Colorists

at the

Eighteenth Annual Meeting
December 2 and 3—Atlanta, Ga.

THE PLACE OF NYLON

SINCE the announcement of the introduction of duPont's new synthetic fiber, christened "Nylon," textile men, including chemists, dyers and finishers, have been wondering to what extent the new product will replace fibers now used and what new uses will be found for it. Whereas the new plant, for which more than $8,000,000 has been appropriated, will not be ready to produce for another year considerable interest in the new product is already apparent. According to the manufacturer's statement concerning the new fiber "it can be fashioned into filaments as strong as steel, as fine as the spider's web, yet more elastic than any of the common natural fibers and possessing a beautiful luster." Inasmuch as the uses of the new fiber will depend upon its special properties and where these properties will be of the most value it will be in order to list these properties which are as follows:—

Extreme sheerness—due to the fact that filaments of extreme fineness can be spun.

High tensile strength—when both wet and dry.

High elasticity—possesses more elasticity than natural fibers.

Uniformity—being a man-made fiber it is subject to true control and can be delivered as a uniform product, with any degree of luster or dullness desired.

Dyeing properties—in general it can be dyed with existing dyestuffs such as silk, wool, acetate rayon and certain of the direct dyes used for cotton and rayon.

Draping qualities—its physical properties indicate that it should possess excellent draping qualities which will be important in the fine dress goods field.

Whereas it is believed that because of its properties it will compete more pronouncedly with real silk than with the other fibers, it does not necessarily mean that it will compete on a price basis alone, inasmuch as its special properties, regardless of price, will recommend its use. If it did come down to a question of price alone there is no doubt but what the new fiber would win out due to the fact that it is compounded of readily available and common materials and further, production can be speeded up to whatever output desired.

While the properties of the fiber, and the introductory effort to date, indicate that the first acceptance of the new product will be in the full fashioned hosiery industry, it is possible that it will displace real silk in this industry more slowly than might be anticipated because the same properties that make it of interest in the hosiery field will also enable it to produce new and distinctly different woven fabrics which should win a place for themselves, thus limiting the amount available for hosiery. Another possible indication of the more rapid acceptance of the fiber in the woven goods field is the fact that the rayon producers have had considerable contact with the woven goods field in the past, whereas their contacts in hosiery have been more or less negligible.

Regardless of the place where Nylon will first be introduced to the consuming public it would look as if chemists, dyers and finishers would have a great deal of the product to handle eventually, basing our prediction upon the properties claimed for it.

Complete
STENOGRAPHIC REPORTS
of the
Eighteenth Annual Meeting
of the A.A.T.C.C.
will appear in future issues of the
AMERICAN DYESTUFF REPORTER

Textile Processing

in Great Britain

A Review of Developments During 1938

A. J. HALL, B.Sc., F.I.C., F.T.I.

IT IS necessary to record that the past year has been disappointing for the textile industry in Great Britain, especially for that section engaged in dyeing and finishing, and this fact is fully reflected in the low share price quotations for many British firms of proved technical efficiency. All this is here generally attributed to lack of confidence in the international situation. However, it is encouraging that no corresponding lack of scientific and technical initiative has been shown, and in many respects textile processing has much improved in technique and achievement.

These are a few features concerning present and likely changes in the textile industry which are of special interest to dyers and finishers. For example, in connection with ladies rayon hose most dyehouses meet with increasing quantities of hose knitted with Bemberg rayon. It is rumored that in the near future acetate rayon hose will be in production and that dyers and finishers will have to give these special attention.

At first much difficulty was experienced with Bemberg hose because dyers found trouble in dyeing so that the shade on the panel of the hose would match that on the cotton top. This has now been partly overcome by using mercerized cotton instead of ordinary cotton (the affinities of Bemberg rayon and mercerized cotton for direct dyes are about equal) and partly by using more suitable dye mixtures. Those who have attempted the dyeing and finishing of acetate rayon hose have found that special care is necessary to avoid the formation of permanent objectionable creases, but no doubt this difficulty will be overcome by longer experience.

A number of special types of finish on cotton and rayon materials introduced two or three years ago now appear to have established themselves in the eyes of retailers and the public. General observation indicates that "trubenising" as applied to the production of non-shrinking anti-crease soft collars for use with men's shirts is extending. Sanforizing similarly appears to be gaining ground. Incidentally both of these processes have originated in America. On the other hand, the anti-crease finish discovered in England is now being much more widely used. Lately, this finish has been coupled with Valanising to produce waterproof and stainproof finishes.

Experience with these and other similar special finishes shows that in England, at least, the introduction of such special processes takes considerably more time than would be expected. There is of course one good reason for this slowness—retailers and the public generally do not wish to be experimented with since they only desire to purchase an article which has been proved satisfactory. But there are other factors which are unnecessarily deterrent—the existence of customary fixed selling prices which are as unalterable as the pyramids, and a certain degree of apathy and inertia on the part of the distributors who come between the dyer and finisher and the public. It is certainly time that some re-organization of the textile industry be made to enable technical improvements in garments and fabrics as discovered by the processer to be brought more directly and quickly to the public for whose express benefit they were discovered.

Crepe rayon fabrics yet command a great deal of attention and dyers are now much better equipped with machinery for dyeing such material. Although the greater proportion of crepe fabric is dyed on winch machines, there is a steady increase in the number of jig machines being used for this same purpose. Of course, the ordinary jig is of no use because of the uneven high tension which it places on the fabric during its travel through the dye liquor, but there are now special types by which it is possible to control the tension on the moving fabric within very small limits and at the same time cause the fabric to travel at a constant rate through the dye liquor.

Lately increased interest has been taken in cellulose ethers for finishing purposes. These ethers are being marketed under various proprietary names but they are mainly of two types—water- and alkali-soluble. One important use for these products is in the permanent stiffening or loading of fabrics and for such purposes they are likely to displace other adhesives such as starch and dextrin.

Unshrinkable wool which is really unshrinkable even after repeated washing is gradually assuming more importance. So far the public has not realized that it can have such wool by simply insisting upon having it. Ordinary people believe that wool *must* shrink in washing. But in the near future the public's ideas on this subject are likely to be changed and then most wool processers will have to take notice. One fact may be quoted which indicates that definite progress being made—the British Army authorities are taking a meritorious lead in requiring that soldiers' wool socks shall have a satisfactory unshrinkable finish.

At the present time most wool processers in England are agreed that the old wet chlorination process is unsatisfactory insofar as it is difficult to obtain uniform results or complete unshrinkability without accompanying impoverishment of the wool. They are therefore turning to the dry chlorine gas process of the Drisol (sulfuryl chloride) process both of which are admitted as being considerable improvements on the old processes. At the moment the Drisol process is being used in several countries on the large scale and appears to have established itself.

For several years acetate rayon, both bright and matt qualities, has been very largely used in England for the manufacture of locknit fabric as used in the manufacture of ladies underwear. This has been a very important trade from the viewpoint of the dyer and finisher. Lately it has been reported that there is a move to produce this fabric with viscose rayon. Such a change will affect hosiery dyers very considerably.

It may be remembered that for finishing such fabric after dyeing two types of machine are in use. One is the pin tenter machine on which the fabric is finished in open width, whilst the other machine dries and finishes the fabric in tubular form (for this the two selvedges are first sewn together). Some two years ago there was a tendency to consider the tenter machine as much the better and many firms installed these machines (mainly obtained from German makers who held the controlling patents). However, this competition has led to many improvements in the tubular machine and now it is doubtful which is the better from the hosiery finisher's viewpoint.

Quite recently the tenter machine has been much improved. Arrangements have been made so that they can now be made in England under license and the English makers have added improvements concerned particularly with the entering-in. In using such a machine for knitted fabric it is necessary to have devices for taking out the curl of the selvedge and for moving the pin chains so that the selvedges are exactly impaled on the pins. For the last named purpose it is necessary for the pin chains to move laterally as the fabric enters more to one side than the other. A pneumatically controlled device is now fitted so that the accommodation of the chains to the fabric is instantaneous. Added to this refinement is a device so that the fabric can be fed in to the tenter at an adjustable rate and up to 40 per cent in excess of the forward rate of travel of the pin chain; closing-up of the fabric lengthwise can thus be obtained.

For many years steam-air circulating dyeing machines such as those of the Longclose Engineering Company Ltd. (Leeds) have been widely used for dyeing knitted goods. In these, circulation of the liquor and goods is maintained by blowing in steam which passes through an injector so as to take with it a certain amount of air. The advantage of this type of machine is that it requires no rotary power —simply a steam supply. This idea has now been applied recently to machines for dyeing wool yarn in skein form and it should prove very useful.

Apart from the so-called bread and butter trade in which all dyers and finishers engage, it would seem that there is a tendency today for individual firms to concentrate on special lines of dyeing and finishing with a view to "getting out of the rut" and being able to command special prices which are more profitable. This seems to be one way of escape from that excessive keen competition which results in dyeing and finishing charges which result in loss rather than profit.

Progress in

Treatment of Textile Wastes

FOSTER DEE SNELL*

SEVERAL interesting methods of treatment of wastes have been published since last reviewed here[5]. An interesting method of disposal is manufacture of carbon disulfide[1] by reaction of cellulose waste from the rayon industry with sulfur or sulfur dioxide at 700-1000°. A large amount of inert heat retentive material such as magnesium oxide, aluminum oxide, silicates or chromates is present and must be infusible at the temperature employed.

The presence of textile wastes in substantial amounts with domestic sewage can make the cost of chemical treatment prohibitive. Addition of 60-300 pounds of anhydrous ferric chloride per million gallons to the raw sewage before entering the plant is helpful[4]. Vat and sulfur dyes are precipitated in the aeration tanks. Owing to the greater solubility of direct dyes it is not effective in their removal.

Simple sand filtration has been found unsatisfactory in treatment of water badly contaminated with textile wastes[6]. Chemical treatment with aluminum sulfate and lime proved effective for coagulation and decolorization. Mercerization liquors have been treated with chlorine or sodium peroxide as oxidizing agents to destroy organic matter including colors, by oxidation[3]. The effectiveness of such treatment is not striking.

Indigo waste is satisfactorily treated with 16.7 pounds of calcium chloride per 1000 gallons[2]. Sulfur dyes are best removed by biological action. Steeping lyes are destroyed by biological filtration. Chlorine treatment is effective for Sulfur Blue and Direct Black. The general methods for treatment of waste from bleacheries and dyeing plants are sedimentation, filtration and coagulation. The usual coagulants are aluminum sulfate, iron salts, lime and calcium chloride.

*Foster D. Snell, Inc.

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Recent Developments in the Chemistry of

Silk and Silk Processing

WALTER M. SCOTT, Ph.D.*

INTRODUCTION

THE previous review, published in the 1937 Processing Review Number of this journal, mentioned the increasing importance of hosiery as a factor in the consumption of silk in this country. During the past year this trend has become even more pronounced. The dominance of hosiery in the silk field is strikingly demonstrated by the following table which was published in a recent issue of the *Rayon Organon*:

U. S. CONSUMPTION OF RAW SILK

12 Months July-June	*Total Silk Deliveries in Bales*	*Percentage Hosiery to Total*
1933-1934	442,180	48.0
1934-1935	473,830	48.1
1935-1936	456,911	55.0
1936-1937	483,742	60.3
1937-1938	380,480	73.6

These figures show that while the total consumption of silk in this country remained more or less constant during the last few years and in fact even increased until it felt the effect of the recent textile depression which started in the summer of 1937, this was largely due to its increased use in hosiery. The synthetic rayon fibers have been gradually replacing natural silk fiber in the manufacture of woven fabrics, as evidenced by the drop in the amount of silk used for this purpose from 230,067 bales during the 1933-1934 period, to 100,486 bales during the 1937-1938 period.

The reason for the continued supremacy of silk in the hosiery field has been the inherent elasticity in the silk fiber. The synthetic fibers, which up to the present time have been chiefly made from cellulose as a base, have never yet been endowed with sufficient elasticity to give as satisfactory performance as natural silk in hosiery. Thus, one of the most significant items of interest to the silk industry was the recent announcement of a new and radically different synthetic fiber, called Nylon or "Fiber 66."

The new fiber may be considered with justice the first really synthetic fiber. The present so-called synthetic fibers are derived from natural raw materials, such as cellulose, casein or waste silk, with little or no alteration of their chemical structure, whereas the protein-like structure of Nylon can be completely synthesized from coal, air and water. Furthermore, it is of special significance to hosiery manufacturers that this new fiber has shown an elastic recovery of 80 per cent while wet, as compared with a 32 per cent recovery for silk under similar conditions, and an elastic recovery of 77 per cent in an atmosphere of 85 per cent relative humidity as compared with 65 per cent for silk.

Although announcement has been made of the construction of a new $8,000,000 plant for the manufacture of Nylon, it is not anticipated that there will be large-scale production of this fiber before the fall of 1939. In the meantime, the present preponderance of hosiery in the silk field justifies the assignment of a special chapter in this review to the processing of silk hosiery.

This article is the fifth in a series of reviews which have appeared in this journal under the same title. These reviews summarize the progress which has been made in connection with the fundamental chemistry of raw silk and the chemical processes which play a part in the transformation of the raw silk into the finished product. The previous articles have reviewed the developments prior to November of the year 1937. The present review brings the story up to November, 1938. For purposes of clarity the subject is divided into four chapters as follows:

1—The Chemistry of Raw Silk.
2—The Preparation of Silk.
3—The Dyeing and Finishing of Silk.
4—The Processing of Silk Hosiery.

Chapter 1

THE CHEMISTRY OF RAW SILK

The Chemistry of Sericin

The study of sericin, which is the water soluble coating of the fiber produced by the silkworm, has largely centered in Japan during the past year. Certain Japanese investigators have given further attention to the two types of sericin, known as Sericin A and Sericin B. For the purposes of their investigation, sericin was separated into its fractions by the method of Mosher which consisted in obtaining an aqueous solution of sericin by degumming silk in water under pressure, adjusting the pH of the cool solution to about 4.0, and thus obtaining a precipitation of Sericin B. Sericin A was precipitated from the filtrate by the addition of alcohol.

The iso-electric point of a solution of Sericin B was found to lie between pH 3.6 and 3.8. The nitrogen content of Sericin A was given as 17.37 per cent and Sericin B as 16.88 per cent. It was determined that the ratio of the nitrogen in Sericin B to the total nitrogen in the combined sericin sol was unaffected by the concentration of sericin in the sol.

The sericin contained in the cocoon layer (i.e., the hot water bath in which the cocoons were soaked prior to reeling) was completely precipitated by alcohol in the presence of a small amount of multivalent ions. When the aqueous cocoon layer was heated, ammonia was produced.

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This production of ammonia increased as the temperature was raised and as the time of heating was prolonged.

The fixation of sericin by chomium salts has been the subject of a detailed investigation which indicated that the theory of its fixation could be reasonably interpreted from the standpoint of the chrome-tanning theory of Collagen. It was found that the strength and elongation of silk were not appreciably affected by the fixation of the sericin on the fiber as a result of the action of chromium salts. However, many scaly cleavages were formed on the surface of the fiber by the chrome fixation which gave it a resemblance to wool. The sericin of yellow raw silk appeared to combine with a smaller amount of chromium than the sericin of white raw silk.

Experiments were also carried out on the action of chrome salts on sericin which had been removed from the fiber. The sericin fraction which was precipitated from the hot water extract of silk cocoons at a pH of 3.8, took up less chromium oxide and more sulfate from basic chromium sulfate than the sericin fraction which was precipitated with alcohol from the filtrate.

The reverse was true when the two sericins were treated with basic oxalatochromate. It was noted that the fixation of sericin by the chromium complex was more effective than by the oxalatochromate complex. In general, the adsorption of chromium by the separated sericin was less than by the raw silk fiber.

Sericin was deaminated on the silk fiber by soaking it for 17 hours in a bath containing sodium nitrate and acetic acid. The loss in weight of raw silk during degumming was decreased by the deamination treatment. Furthermore, there was a noticeable decrease in the quantities of chromium oxide and of sulfate which were adsorbed after deamination.

The Chemistry of Fibroin

Reference has been made in previous reviews to the basic analysis of the fibroin of the common silkworm (*Bombyx mori*) by Abderholden, who reported the following percentages of amino acids: 40.5 per cent glycine, 25.0 per cent alanine, 11.0 per cent tyrosine, 2.5 per cent leucine, 1.8 per cent serine, 1.5 per cent arginine, 1.5 per cent phenylalanine, 1.0 per cent proline, 0.85 per cent lycine and 0.75 per cent histidine.

A recent paper by Bergmann and Niemann states that the analysis of silk fibroin demonstrates that this protein is constructed according to the same general structural principles as those previously advanced for cattle fibrin and globulin and egg albumin. These authors conclude that glycine, alanine, tyrosine, arginine, lysine and histidine account for ½, ¼, 1/16, 1/216, 1/648 and 1/2592, respectively, of the total number of amino acids produced by the complete hydrolysis of fibroin. They claim that fibroin must contain at least 2592 amino acid residues and if an average molecular weight of 84 is assumed for each residue, the minimum molecular weight of fibroin would be approximately 217,700. However, there is some doubt as to the accuracy of the value for histidine so that the value of 2592 cannot be accepted as final.

A rather complete structural characterization of the fibroin molecule is now possible, since the amino acids determined by the above-mentioned studies account for approximately 85 per cent of all the amino acid residues originally present in the intact protein molecule. Silk fibroin appears to be distinguished from all other known proteins by the simplicity of its structure. The two simplest monoamino monocarboxylic acids, glycine and alanine, account for about ¾ of all the amino acid residues present in the molecule and exhibit a frequency of 2 and 4, respectively. The accuracy of this statement is less open to question because of the perfection of new analytical methods in which glycine is precipitated by potassium trioxalatochromate and alanine by sodium dioxypyridate.

In no other protein has there been found a frequency of 2 for a simple amino acid like glycine, although in collagen and elastin, glycine occurs with a frequency of 3. Also, in no protein other than fibroin is it possible to formulate a structure in which all of the asymetric carbon atoms, together with the side chains attached to them, will lie on one side of the main chain.

Studies of the oxidative degradation of silk fibroin have been continued. Wild silk fibroin, regular silk fibroin and silks weighted with lead, iron, zinc, tin and tin-lead, respectively, were treated for 10 hours at 40° C. in neutral and in acidic solutions of potassium permanganate containing from 0.0028 to 0.0404 mols. of permanganate and zero to 0.06 mols. of sulfuric acid. The silks were analyzed for weight, ash, nitrogen content and wet strength before and after treatment.

It was found that the percentages of ash increased with increasing concentrations of potassium permanganate. In general, the loss of nitrogen and of strength were greater in neutral than in acid permanganate, with the loss of strength usually exceeding the loss of protein. The rating of the various silks in the order of increasing loss of strength under similar conditions of treatment was: wild silk, iron-weighted silk, regular silk, and lead-weighted, tin-weighted, zinc-weighted and tin-lead-weighted silk.

Fibroin A and Fibroin B

The Japanese investigator, Kaneko, has continued his investigation of the two fibroin components whose separation and isolation were described in the last review. Fibroin A was reported to have a higher specific gravity, isoelectric point and tyrosine content than Fibroin B, and to be similar to sericin in many of its physico-chemical properties. Subsequently it has been demonstrated that Fibroin A absorbed inorganic acids, acid dyestuffs, iodine and heavy metallic salts in higher proportions than Fibroin B. Organic acids and basic dyestuffs were absorbed more readily by Fibroin B. Both fibroins tended to absorb inorganic acids more readily than organic acids.

Further distinctions between the A and B types were obtained by their behavior with nitric and with nitrous acids. Both fibroins dissolved in concentrated nitric acid to form yellow solutions. The coloration was deeper in the A solution than in the B solution. When the solutions in nitric acid were diluted with water to ten times the volume,

the solution of Fibroin A became turbid instantly, while the precipitation was noticeably slower in the solution of Fibroin B. Both fibroin components were diazotized with nitrous acid and coupled with naphthols, phenols and amines to form azo dyestuffs on them. The depth of color was generally greater on Fibroin A than Fibroin B.

Dispersions of the fibroin components in 50 to 95 per cent sulfuric acid solutions showed a lower viscosity than the dispersion of the original fibroin under like conditions. This was probably due to the loss of the characteristic fibroin structure by the fibroin components in the sulfuric acid and loss of the high viscosity of the fibroin micelles. It was found that the micellar structure of the fibroin tended to disintegrate and the fibroin dispersion became more nearly comparable to the dispersions of its components with increased temperature, longer duration of the action and a higher water content in the sulfuric acid solution.

Fibroin Solutions and Reactions

The literature during the past year continued to indicate interest in the utilization of silk waste by dissolving it without substantial degradation and regenerating it in the form of a synthetic fiber. As stated in the last review this interest is centered in Germany and in Japan and the process has not yet received much attention in commercial circles in this country. A recent patent, assigned to a German concern, claims that satisfactory artificial fibroin threads are obtained by dissolving waste silk in a concentrated aqueous solution of sodium thiocyanate at a temperature not over 80° C, removing the electrolyte from the solution by dialysis and then spinning the solution into a coagulating bath consisting of a concentrated aqueous solution of ammonium sulfate. The properties of the fibers are improved by stretching. Further studies were made of the action of alkaline copper solutions on silk fibroin. Two compounds having fibroin, copper and ethylenediamine combined in the ratios of 1 : 1 : 1 and 1 : 2 : 2 were studied. The use of excessive amounts of the amine tended to retard the rate of solution of the fibroin and to decrease its solubility in the copper-amine solution. The reactions leading to the formation of the fibroin-copper-amine complexes were assumed to be first a combination of copper hydroxide and ethylenediamine and then a reaction of this double complex with fibroin to form the triple complex with the release of water.

It has been suggested that silk waste could also be utilized by partially dissolving it in an alkaline hydroxide solution containing some sodium sulfite and then converting it into flock by precipitating it in a dilute solution of hydrochloric acid.

The reaction of fibroin with ketene gas was mentioned in the previous review. It has now been shown that ketene combines not only with the known phenolic and alpha-amino groups in fibroin, but also with other unidentified groupings in the protein molecule. The degree of acetylation of degummed fibroin has been carried to a maximum of about 7 per cent of acetyl groups.

A recent patent claims that protein materials, such as silk or wool, can be modified by treatment with a large number of agents which are capable of reacting with a NH_2 or NH group to yield a substituted amidine. Among the agents specified were cyanogen halides, cyanamide and its dialkyl derivatives, and ethers of isourea or isthiorea. These reactions serve to modify the affinity of the silk or wool for dyes, dye components, mordants, weighting agents and agents for combating pests. The affinity of silk for dyes may also be increased by treatment with quartenary ammonium compounds, sulfonium derivatives and ethylene or propylene oxide.

Internal Structure of Fibroin

A vacuum camera has been used to determine the lattice constants of silk and wild silk in the perfectly dry state and in the wet state by means of X-rays. The lattice constant of perfectly dry fibroin was found to be less than that of wet fibroin. It appeared that eight molecules of water penetrated into the unit cell of the dry fibroin and that this change was reversible. The measurement of density by dipping a fibrous substance such as silk into a liquid was not perfect even with the evacuation method because of the presence of very narrow intermicellar spaces into which the liquid could not penetrate. The width of the intermicellar spaces in silk fibroin, viscose rayon and ramie did not appear to be uniform. In silk it varied from 0 to 10 Angstrom units.

Miscellaneous

The previous review described a method developed by Trotman for the detection of damage in silk. The method was based upon measuring the viscosity of a solution of the silk in an aqueous solution of zinc chloride under definitely prescribed conditions of concentration, temperature and time. A Canadian investigator has recently reported that a higher temperature with a shorter period of time than prescribed by Trotman gave equally satisfactory results and was more convenient for a routine test. The change in viscosity of the silk solution as the time of digestion was increased, was due to a gradual hydrolysis of the silk subsequent to the dispersion process.

Damage to weighted silk could be detected if the weighting was removed from the silk before it was dispersed in the zinc chloride solution. The viscosity of damaged silk was correlated with tensile strength and amino nitrogen content in evaluating the damage resulting from boiling dilute acids and alkalis, as well as from light and from superheated steam. With boiling dilute acid, hydrolysis of the amino groups occurred prior to the dispersion, whereas with the alkali, disintegration of the fibers into fibrils took place very readily and the fibrils were dispersed in the alkaline solution before much hydrolysis occurred. The action of steam appeared to differ from the action of acids, alkalies or light.

The sulfur content of raw silk has been carefully determined. Silk cocoons contained an average of 0.119 per cent of sulfur. Reeled silk contained 0.116 per cent sulfur, but after treatment with a hot 0.3 per cent solution of sodium oleate for 8 hours, the sulfur content was reduced to 0.098 per cent.

Chapter 2
THE PREPARATION OF SILK

Soaking

The patent literature describes new products which are claimed to be suitable for the soaking of silk preparatory to winding and weaving. In one case, the soaking bath contains a soaking oil as a negatively charged disperse phase, and a discharging agent, such as ammonium sulfate or fluosilicate, is added to gradually exhaust the bath. In another case the silk threads are impregnated with an aqueous dispersion of mahogany sulfate, a sulfonated vegetable oil and a textile treating oil in order to render the silk suitable for the manufacture of piece goods.

From a mechanical standpoint the soaking of silk is still accomplished in three different ways: (1) by immersing the yarn in open standing baths, (2) by circulating the soaking liquor through the silk and (3) by forcing the soaking oils into the silk with the aid of pressure in a closed system. The advantages and disadvantages of each soaking method were discussed in a recent general article on the subject.

Degumming and Bleaching

The degumming of waste silk by means of enzymes has been studied in some detail in Japan. When raw silk was immersed in a peptone solution for an extended period of time, 43 per cent of the crude sericin and 23 per cent of the crude fat contained in the silk were decomposed by neutral fermentation which did not injure the silk. In general, aerobic fermentation was found to be more effective than anaerobic fermentation.

Eighteen strains of aerobic bacteria were isolated from various kinds of degumming liquids collected from different silk mills. These strains included 4 strains of cocci, 1 of short bacillus and 13 of bacilli. Two strains of bacilli were found to be most effective for degumming silk. These two strains resembled *Bacillus cereus* Frankland. They exhibited their highest effectiveness at a temperature of 35-40° C. and a pH of 6.5. The only differences found between the two bacterial strains were in the state of their growth and in their liquefying power for gelatin or blood serum.

Raw silk was degummed by soaking it for 5 days at 35° C. in a culture solution of *Bacillus cereus* with toluene. It was also degummed by an extract of the bacterium body. The degumming was thought to be due to the action of a specific kind of enzyme which was called "degummase." This enzyme exhibited optimum action at a pH of 1 to 8 and a temperature of 40° C. It was destroyed by heating at 65° C. for 2 hours.

Fabrics having a pile containing cellulose acetate and a back containing natural silk, were claimed to be degummed without injury to the acetate by the action of a hot degumming bath which contained olive-oil soap and at least 0.5 per cent of sugar.

A new bleaching bath for silk, as well as other textile fibers, contained in place of hydrogen peroxide the product resulting from the combination of 1 mol. of hydrogen peroxide with 3 mols. of urea. Degummed tussah silk may be bleached by the action of a bath at 40-60° C. containing hydrogen peroxide and ammonium or sodium persulfate. The optimum pH for the bleaching bath is about 10. A supplementary bleach with a reducing agent such as sodium bisulfite may be used.

Weighting

The only study of the weighting of silk reported in the literature during the past year was made by two investigators in India. They experimented with Eri-silk and with Mysore-Japanese silks. These two types of silk were soaked for 30 minutes at 28° C. in solutions of lead acetate of varying concentrations which were adjusted to various pH values, and then dried. It was found that under these conditions the fibers could be loaded to the extent of 105 per cent increase in weight.

A German patent claims that silk can be weighted satisfactorily in a single bath containing tin tetrachloride, disodium phosphate, magnesium chloride and formic acid. The use of a protective colloid is optional. After removal from the weighting bath, the silk is rinsed and the weighting is then fixed on the fiber by the action of ammonia and a final treatment with a solution of sodium silicate.

Chapter 3
THE DYEING AND FINISHING OF SILK

Dyeing

The procedure used to develop a suitable black color on silk skeins or thread has been reviewed in a German textile magazine. In brief, the silk is first degummed with soap suds then treated with tin chloride, black iron liquor (acetate of iron) or nitrate of iron. The silk is next blued in a bath containing potassium ferrocyanide and a small amount of hydrochloric acid, and finally treated in a catechu bath.

A further discussion has been given of the problems involved in the dyeing of silk with dyes of the Naphthol A S type. It was emphasized that tin-weighted silk could not be satisfactorily dyed with dyestuffs of this class.

Azo dyes have been prepared on silk by treating the silk first with amides formed by the interaction of fatty acid chlorides with aminonaphthalene sulfonates followed by a treatment in a bath containing diazonium compounds.

Printing

Several general articles dealing with the printing of natural silk, either alone or in conjunction with rayon, have appeared during the past year. In one article particular stress was laid on the function of thickeners in printing pastes. It was mentioned that the thickeners should possess substantial penetrating and leveling powers because of the rod-like construction of rayon and silk. Another author gave a practical description of the art of stencil printing on natural silk and on rayon as it is practiced in the Lyons district of France.

The subject of lacquer printing has received a certain amount of attention in connection with fabrics of silk as well as of other fibers. It is stated that lacquer colors tend to bleed in the soaping bath but that they are re-

sistant to dry cleaning solvents with the exception of ethylene dichloride. A recent United States patent describes the application to a fabric of a water-miscible solution from which a water-insoluble pigment may be precipitated by the addition of water. For example, a mixture of a basic dye with phosphododecitungstic acid, nitrocellulose and anhydrous diethylene glycol ethyl ether is applied and the fabric is then moistened to precipitate the color lake in and on the fibers.

Finishing

Several methods for delustering silk as well as rayon have been described in the patent literature. Silk may be delustered by a mixture of lithopone with a solution of the condensation product of a naphthalene sulfonic acid with formaldehyde and polyvinyl methyl ether. The silk is immersed in the above mixture at room temperature with agitation, then hydroextracted and dried. Or silk may be treated in a bath containing sodium stannate, squeezed and immersed in a solution of an amide of one of the higher fatty acids.

New types of oiled silks are being made by the use of special varnishes and lacquers. Vinyl resin lacquers have come into favor for this purpose as they give an odorless, colorless fabric that does not become discolored or tacky during storage. Patent protection has also been obtained for a process by means of which a silk fabric is coated with rubber latex while still retaining its original flexibility.

It is claimed that the electrical resistance of silk yarns is improved by treatment with dry steam. The material is first treated with acetic or hydrochloric acid to remove the natural salts and then steamed under pressure. The condensation of steam on the silk is avoided by maintaining the temperature above the boiling point of water for a short time after the steam is removed.

Chapter 4
THE PROCESSING OF SILK HOSIERY

Problems in connection with the dyeing and finishing of silk hosiery have occupied the attention of a number of investigators during the past year, for the reasons mentioned at the beginning of this review. It does not come within the scope of this article to discuss this subject in great detail but it is of interest to briefly outline the present trends.

Throwing

Until fairly recently, silk was commonly prepared for knitting into hosiery by soaking it in simple emulsions of soap and emulsifiable oils, such as olive oil or neatsfoot oil. However, with the advent of chiffon and sheer hosiery, much lighter yarns were required and it was necessary to give greater flexibility and hygroscopicity to the raw silk. Consequently the older soaking emulsions were largely replaced by the so-called "soluble silk oils" of the sulfonated type, often with additions of mineral oils, glycerine and considerable amounts of sodium carbonate or a similar alkali. It has been found necessary to use considerable care in controlling the alkalinity of the soaking bath because variations in the alkalinity of the throwing solutions are apt to affect the shade of the dyed hosiery.

Degumming and Dyeing

At the present time hosiery is degummed and dyed by one of three methods, designated as two-bath, split-bath and single-bath process. The two-bath method, as its name implies, accomplishes the degumming in a preliminary operation and the dyeing in a subsequent fresh bath. This was generally accepted as good practice in the earlier days but, like the earlier throwing solutions, has encountered numerous objections in recent years and is now becoming more or less obsolete. In the split-bath method the throwing oils are largely removed in a preliminary treatment and the dyeing operation includes the removal of the sericin (silk gum.) In the single-bath method the removal of throwing oils as well as sericin takes place in the dye bath. Experience has shown that either of these last two methods can be practiced satisfactorily at the present time if proper control of the baths is exercised.

Mosher has listed the following functions which a silk hosiery degumming and dyeing bath should fulfill:

1—An initial pH not greater than 10.5.
2—Sufficient alkaline reserve to maintain the pH above 9.2 during the period of active degumming.
3—Produce a minimum of Sericin B degradation.
4—Maintain all throwing and needle oils in an emulsified state.
5—Suspend all metallic soaps in a dispersed state.
6—Contain dye stabilizing agents with which to prevent reduction of sulfocyanine hosiery dyes.
7—Where necessary, have present colloidal protectorants to prevent filaments chafing.
8—Where necessary, have present dye levellers to compensate for variable conditions of alkalinity in the lot of hosiery.

Excess of alkali is considered to be the chief damaging agent in the processing of silk hosiery. This can be largely minimized by the use of protective colloids in the dye bath. By means of the Frasier Hosiery Testing machine which measures the distensibility (the ease with which a stocking can be distended), recoverability (the ability of the stocking to regain its shape after being distended) and stretch endurability (the number of stresses or cycles required to produce a failure) of full-fashioned hosiery, Koons demonstrated the beneficial effect of protective colloids in the dye bath.

Considerable interest has lately been shown in the production of iridescent shades in hosiery dyeing. It has been pointed out that a range of fluorescent dyes are available for this purpose but that the degree of fastness to light should be taken into consideration. Acid violets have the best fastness to light of dyes of this class. In fluorescent dyeing, better results are obtained in an acidified dye bath because of the greater affinity of the acid dyes for the silk fiber.

Finishing

The subject of delustered silk hosiery has recently received some attention. It is stated that the delustering

may be accomplished in the dye bath or subsequently by direct precipitation, hydrolytic precipitation and absorption methods. Softeners are generally required. Certain pigments are less suitable than others for delustering purposes. For example, stockings which had been delustered with zinc sulfide gave an objectionable evolution of hydrogen sulfide when acted upon by perspiration.

An American patent describes a matting process for silk hosiery in which the stockings are mounted on forms, preliminarily moistened to loosen the fibers and then sprayed with a matting liquid, followed by a rolling and pressing treatment. A British patent claims that silk stockings are rendered ladder-proof by immersing them in a bath containing aluminum sulfate or alum, steaming, soaping, rinsing and washing. Gelatin is preferably included in the alum bath.

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Sodium Alginate as a
Print Thickening Paste

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SINCE very little technical information concerning the use of sodium alginate as a print paste thickener has been published, it is thought that technical information giving a comparison between the properties of sodium alginate and those of other well known thickeners would be of interest to the members of the A. A. T. C. C. The physical properties of pastes made from the various materials will be given as well as data showing the influence of the thickening pastes on the color yield given by the print pastes, penetration, brightness and sharpness of detail of the print, and the ease of removal of the paste from the cloth after printing.

An important property of sodium alginate is the property of the material to form viscous solutions in water, and this forms the basis for its use as a thickening agent in print pastes. This property alone would not make the material unique. Other materials also give viscous solutions in

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water. However, sodium alginate is a definite chemical compound. It is chemically pure and uniform in its chemical and physical properties. Its thickening power is always the same, it contains no impurities that must be removed from the paste, and the color value given by the paste is always the same. There is no necessity for making elaborate plant tests on each individual batch of sodium alginate—no necessity for filtration, boiling or other special handling.

Regardless of any merit that sodium alginate might have for use as a print paste thickener because of the uniformity of its physical and chemical characteristics and its high colloidal efficiency, its value as a print paste thickening agent had to be determined in laboratory tests and practical plant work before it could be of value to colorists and printers. All of this work was done several years ago and many plants throughout this country and Canada use this material today. The results of these tests are published here for the first time.

1. PHYSICAL CHARACTERISTICS OF VARIOUS THICKENING PASTES

A. Falling Ball Viscosity Tests

One common method for measuring the viscosity of solutions or pastes is to determine the time required for a steel ball to fall vertically through a given thickness of the material. In the tests being reported here a long test tube having an inside diameter of 7/16 in. was used and the time required for a steel ball (diameter 1/16 in.) to fall through 15 cm. at 20° C. was taken as a measure of the viscosity. Pastes containing only the thickening material and water were tested and in addition tests were made with pastes containing more than one thickening material. This data is given in Table 1. The sodium alginate paste was made by stirring the dry powder into water at room temperature. The agitation was continued for one hour at which time a smooth, free-flowing paste was obtained. The corn starch, wheat starch, and British Gum pastes were made by the use of an apparatus similar to that used by Glarum (Am. Dyestuff Reporter, 26, p. 437). The starches were heated for four hours at 210° F. The Tragacanth paste was made by first soaking the dry gum in water over night and then cooking the mixture at 210° F. for four hours.

B. Flow Curves by Stormer Viscometer

The Falling Ball viscosity test gives a very accurate comparison of the viscosities of the various pastes but it does not give as good an indication of the manner in which the paste will perform in the print machine as the fluidity-load curve given by a test with a Stormer Viscometer. For that reason we have included flow curves made with the Stormer Viscometer. Pastes containing only the thickening material were tested as well as complete print pastes containing one or more thickeners. The results are given in Graphs "A" and "B." The curves show conclusively that sodium alginate produces

TABLE 1

Paste No. (as listed on Graphs)	*Thickening Materials Contained in the Pastes*	*Viscosity (Falling Ball Time in Seconds)*
1.	1.5% Sodium Alginate plus Reagents.	208
2.	8.0% Tragacanth Paste	42.4
3.	1.9% Sodium Alginate	621.0
4.	9% Wheat Starch plus Reagents...	67000
5.	9% Corn Starch plus Reagents.....	72000
6.	6% Corn Starch, 4% Tragacanth, plus Reagents	972
7.	7% Corn Starch, 2.4% Tragacanth, plus Reagents	1376
8.	0.8% Sodium Alginate, 6.0% Corn Starch, plus Reagents.....	718
9.	1.0% Sodium Alginate, 4.0% Corn Starch, plus Reagents.....	1050

thickening pastes whose physical characteristics fall within the limits for a good printing color (See Am. Dyestuff Reporter, 25, 150, 1936). Where viscosity tests, flow tests, and other physical tests have been made on complete print pastes, we have done work with typical *Vat* dye print pastes. There has been a considerable amount of work done on the viscosity and flow curve requirements for a satisfactory *Vat print paste* and we feel that the results of our work will be more valuable because they can be compared with the standards already set up. The shape of the fluidity curve given by a solution of the sodium alginate alone is not changed by the additions of the Vat dye or the other chemicals used in the complete paste. (See curves 1, 3, 8 and 9, Graph "A"). Practical plant experience has shown that sodium alginate gives satisfactory Rapidogen, Indigosol, Pharmasol print pastes when used along with starch. It also gives good results when used in discharge pastes and in special padding pastes.

C. Drip Tests

Printers and colorists frequently judge the flow properties of thickening pastes by noting the flow or drip that they give when poured from a stirring rod. We have included pictures (see Figures 1, 2, 3, 4, 5, 6, 7, 8 and 9) showing the drip given by various thickening pastes. These tests are practical observations which give a good indication of the degree of dispersion of the thickening agent in the paste. Ordinary starch, Gum Tragacanth, and some of the natural gums are only partially soluble in water and the drip of pastes made from these materials is short and uneven due to the fact that the paste is not homogeneous. When the starch has been converted into a soluble form such as British Gum, it forms a much more homogeneous paste and one which has a long, smooth drip.

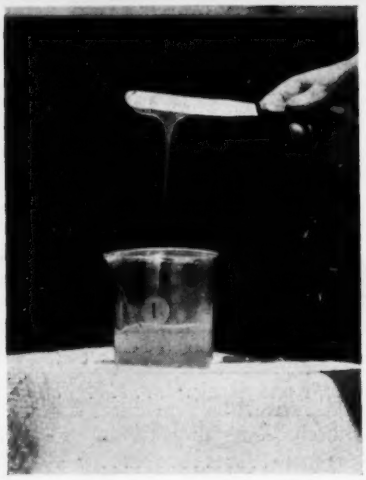


FIGURE 1—Picture showing drip given by paste consisting of 1.5 per cent sodium alginate, 13.5 per cent sodium carbonate, 12.0 per cent sulfoxylate, 6.0 per cent glycerine and 67.0 per cent water.

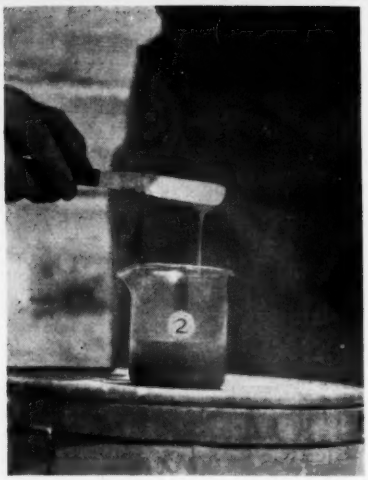


FIGURE 2—Picture showing drip given by paste consisting of 8.0 per cent gum tragacanth and 92.0 per cent water.

FIGURE 3—Picture showing drip given by paste consisting of 1.9 per cent sodium alginate and 98.1 per cent water.

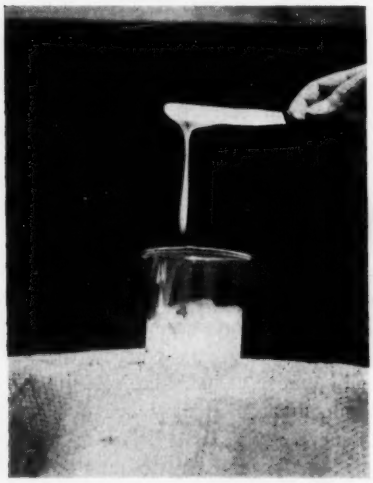


FIGURE 4—Picture showing drip given by paste consisting of 9.0 per cent wheat starch, 10.1 per cent sodium carbonate, 9.0 per cent sulfoxylate, 4.5 per cent glycerine and 67.4 per cent water.

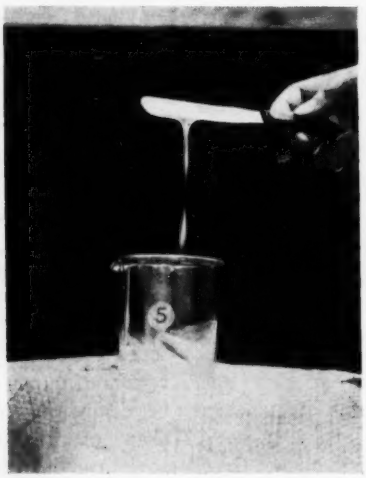


FIGURE 5—Picture showing drip given by paste consisting of 9.0 per cent corn starch, 10.1 per cent sodium carbonate, 9.0 per cent sulfoxylate, 4.5 per cent glycerine and 67.4 per cent water.

FIGURE 6—Picture showing drip given by paste consisting of 6.0 per cent corn starch, 4.0 per cent gum tragacanth, 6.8 per cent sodium carbonate, 6.0 per cent sulfoxylate, 3.5 per cent glycerine and 73.7 per cent water.

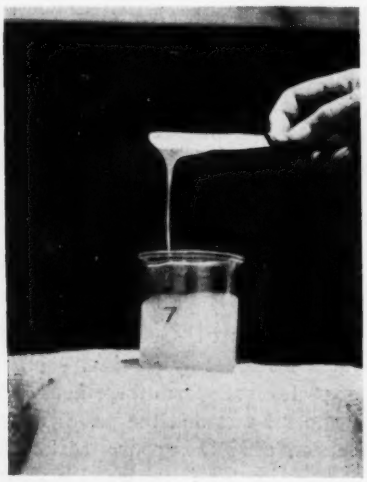


FIGURE 7—Picture showing drip given by paste consisting of 7.0 per cent corn starch, 2.4 per cent Gum Tragacanth, 7.9 per cent sodium carbonate, 7.0 per cent sulfoxylate, 3.5 per cent glycerine and 72.2 per cent water.

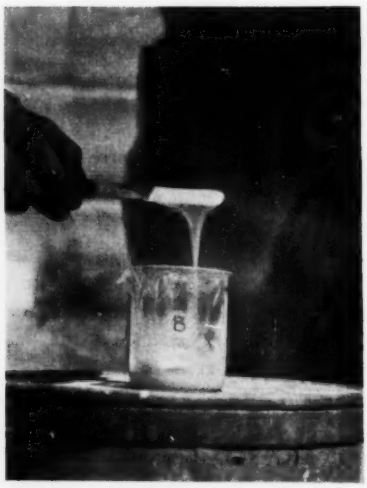


FIGURE 8—Picture showing drip given by paste consisting of 0.8 per cent sodium alginate, 6.0 per cent corn starch, 13.5 per cent sodium carbonate, 12.0 per cent sulfoxylate, 6.0 per cent glycerine and 61.7 per cent water.

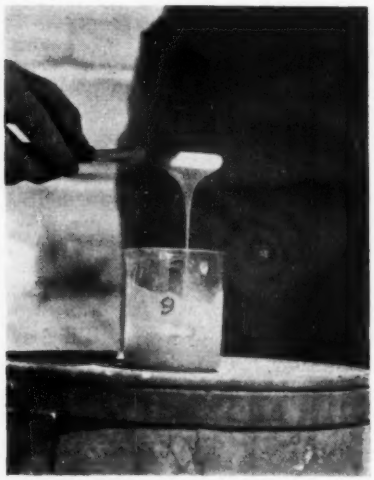
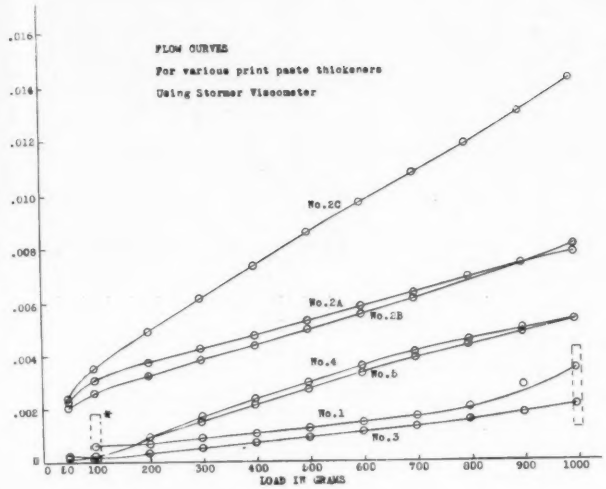


FIGURE 9—Picture showing drip given by paste consisting of 1.0 per cent sodium alginate, 4.0 per cent corn starch, 13.5 per cent sodium carbonate, 12.0 per cent sulfoxylate, 6.0 per cent glycerine and 63.5 per cent water.



Graph A

Curve No. 1—Curve given by paste consisting of 1.5 per cent sodium alginate, 13.5 per cent sodium carbonate, 12.0 per cent sulfoxylate, 6.0 per cent glycerine and 67.0 per cent water.

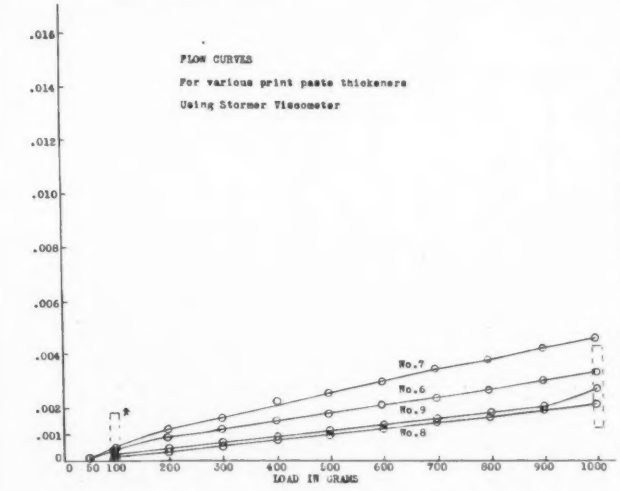
Curves Nos. 2A, 2B and 2C—Curves given by pastes consisting of 8.0 per cent tragacanth gum and 92.0 per cent water.

Curve No. 3—Curve given by paste consisting of 1.9 per cent sodium alginate and 98.1 per cent water.

Curve No. 4—Curve given by paste consisting of 9.0 per cent wheat starch, 10.1 per cent sodium carbonate, 9.0 per cent sulfoxylate, 4.5 per cent glycerine and 67.4 per cent water.

Curve No. 5—Curve given by paste consisting of 9.0 per cent corn starch, 10.1 per cent sodium carbonate, 9.0 per cent sulfoxylate, 4.5 per cent glycerine and 67.4 per cent water.

*The cross-section bars placed on the graph, just above the 100 gram and 1000 gram points on the horizontal axis indicate the limits established for the flow properties of a printing color which will most accurately reproduce a fine pattern and work properly in the print machine. (See AMERICAN DYESTUFF REPORTER, 25, 150.)



Graph B

Curve No. 6—Curve given by paste consisting of 6.0 per cent corn starch, 4.0 per cent gum tragacanth, 6.8 per cent sodium carbonate, 6.0 per cent sulfoxylate, 3.5 per cent glycerine and 73.7 per cent water.

Curve No. 7—Curve given by paste consisting of 7.0 per cent corn starch, 2.4 per cent gum tragacanth, 7.9 per cent soduim carbonate, 7.0 per cent sulfoxylate, 3.5 per cent glycerine and 72.2 per cent water.

Curve No. 8—Curve given by paste consisting of 0.8 per cent sodium alginate, 6.0 per cent corn starch, 13.5 per cent sodium carbonate, 12.0 per cent sulfoxylate, 6.0 per cent glycerine and 61.7 per cent water.

Curve No. 9—Curve given by paste consisting of 1.0 per cent sodium alginate, 4.0 per cent corn starch, 13.5 per cent sodium carbonate, 12.0 per cent sulfoxylate, 6.0 per cent glycerine and 63.5 per cent water.

*The cross-section bars placed in the graph just above the 100 gram and 1000 gram points on the horizontal axis indicate the limits established for the flow properties of a printing color which will most accurately reproduce a fine pattern and work properly in the print machine. (See AMERICAN DYESTUFF REPORTER, 25, 150.)

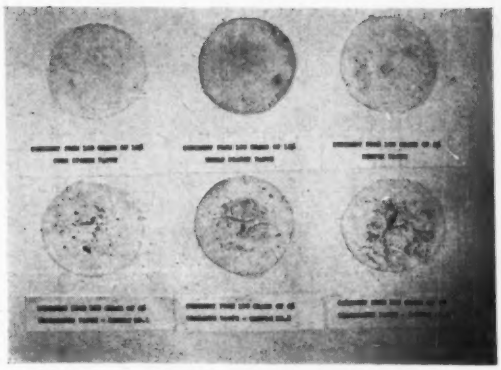


Figure 10—Picture showing filtration disks and dirt and foreign material removed by filtration of 500 grams of the various pastes.

D. Filtration Tests

Any dirt or grit in a thickening can cause damage to the printing roller. Therefore it is important to use a thickening material that is free from any foreign impurities. Figure 10 shows the amount of insoluble impurities from 500 grams of thickening paste. The paste was forced through a filter disk and these filter disks are shown in the picture to give a comparison of the amount of impurities introduced into the paste by the different thickening materials.

2. INFLUENCE OF VARIOUS THICKENING PASTES ON THE RESULTS GIVEN BY PRINT PASTES IN ACTUAL PRINTING PRACTICE

Strike-off prints on cotton cloth were made in a regular printing machine by placing the pastes on the doctor blade separated by cloth dams. In this way the pastes were printed on the same piece of cloth and under the same printing conditions.

The color value of the various samples was determined by a visual comparison of the prints. The brightness and penetration of the various prints also were determined by a visual comparison. Softness of hand was judged by handling the cloth. In all of these cases where the comparisons were made by judgment, several people were asked to make comparisons and list their ratings. Table 2 gives the data obtained by making print strike-offs on cotton with Rapidogen, Pharmasol, Diagen, Indigosol dyes and hydrosulfite discharge prints on a Direct and Developed color.

The data in Table 2 discloses the following printing characteristics of the sodium alginate paste:

A. Washability

The paste is completely soluble in water and it is not rendered insoluble by any of the printing processes so that even large blotch prints wash out well, and the cloth is left soft. If the print paste does not wash out easily, the job of washing the cloth is more complex and expensive and often times defective pieces are caused by "mark-off" trouble in the washer. Then, too, if the cloth is left stiff because of the thickener that cannot be washed out it is

TABLE 2

Data on Print Strike-off Tests Showing Influence of Thickening Paste on Printing Results

Thickening Material in Individual Pastes	*Brightness of Color*	*Color Yield*	*Sharpness of Detail*	*Penetration*	*Softness of Hand*	*Print Paste Formula*	*Per Cent*	*Remarks*
75.0%-12.0% Starch Paste	2nd Best	Best	Fair	Poor	Poor			
50.0%-12.0% Starch Paste 25.0%- 6.0% Gum Tragacanth Paste	Poor 3rd	Poor 3rd	Good	Good	Good			
50.0%-12.0% Starch Paste 25.0%- 2.5% Sodium Alginate Paste	Best	2nd Best	Good	Good	Best	Rapidogen Red Caustic Solution (25.0% NaOH) Cellusolve Thickener Paste Water	2.0 3.0 8.0 75.0 12.0	
75.0%-12.0% Starch Paste	2nd Best	Best	Fair	Poor	Poor			
50.0%-12.0% Starch Paste 25.0%- 6.0% Tragacanth Paste	Poor 3rd	Poor 3rd	Good	Good	Good			
50.0%-12.0% Starch Paste 25.0%- 2.5% Sodium Alginate Paste	Best	2nd Best	Good	Good	Best	Rapidogen Brown IPT (paste) Caustic Solution (25.0% NaOH) Thickening Paste Water	10.0 3.0 75.0 12.0	
60.0%-12.0% Starch Paste	2nd Best	Best	Fair	Poor	Poor			
40.0%-12.0% Starch Paste 20.0%- 6.0% Tragacanth Paste	Poor 3rd	Poor 3rd	Good	Good	Good			
40.0%-12.0% Starch Paste 20.0%- 2.5% Sodium Alginate	Best	2nd Best	Good	Good	Best	Pharmasol Yellow GN (paste) Caustic Solution (25% NaOH) Thickening Paste Water	20.0 1.0 60.0 19.0	
60.0%-12.0% Starch Paste	2nd Best	Best	Fair	Poor	Poor			
40.0%-12.0% Starch Paste 20.0%- 6.0% Tragacanth Paste	Poor 3rd	Poor 3rd	Good	Good	Good			
40.0%-12.0% Starch Paste 20.0%- 2.5% Sodium Alginate Paste	Best	2nd Best	Good	Good	Best	Pharmasol Scarlet SNN (paste) Caustic Solution (25% NaOH) Thickening Paste Water	10.0 1.0 60.0 29.0	
75.0%-12.0% Starch Paste	2nd Best	Best	Fair	Poor	Poor			
50.0%-12.0% Starch Paste 25.0%- 6.0% Tragacanth Paste	Poor 3rd	Poor 3rd	Good	Good	Good			
50.0%-12.0% Starch Paste 25.0%- 2.5% Sodium Alginate Paste	Best	2nd Best	Good	Good	Best	Diagen Black MP Caustic Solution (25.0% NaOH) Cellusolve Thickening Paste Water	2.0 3.0 8.0 75.0 12.0	
75.0%-12.0% Starch Paste	2nd Best	Best	Fair	Poor	Poor			
50.0%-12.0% Starch Paste 25.0%- 6.0% Tragacanth Paste	Poor 3rd	Poor 3rd	Good	Good	Good			
50.0%-12.0% Starch Paste 25.0%- 2.5% Sodium Alginate Paste	Best	2nd Best	Good	Good	Best	Diagen Red AG Caustic Solution (25.0% NaOH) Cellusolve Thickening Paste Water	2.0 3.0 8.0 75.0 12.0	

93.2%-12.0% Starch Paste .....2nd Best	Best	Fair	Poor	Poor	
62.2%-12.0% Starch Paste					Indigosol Green IBA (paste).... 6.2
31.1%- 6.0% Tragacanth Paste 3rd	Poor 3rd	Good	Good	Good	Neutral Chromate Solution..... 0.6
					Thickening Paste 93.2
62.2%-12.0% Starch Paste					
31.1%- 2.5% Sodium Alginate Paste..Best	2nd Best	Good	Good	Best	
80.0%-12.0% Starch Paste .....2nd Best	Best	Fair	Poor	Poor	
53.3%-12.0% Starch Paste					Indigosol Blue O4B..... 10.3
26.7%- 6.0% Tragacanth Paste 3rd	Poor 3rd	Good	Good	Good	Sodium Chromate Solution..... 1.6
					Thickening Paste 80.1
53.3%-12.0% Starch Paste					Glycerine 8.0
26.7%- 2.5% Sodium Alginate Paste..Best	2nd Best	Good	Good	Best	
					4 lb./gal. Hydro (Sodium sulfoxylate formaldehyde) 25.0
75.0%- 6.0% Tragacanth Paste		Good	Good	Good	Paste 75.0
					Thickening Paste .....
75.0%- 2.5% Sodium Alginate Paste..		Good	Excellent	Best	
					4 lb./gal. Hydro (Sodium sulfoxylate formaldehyde) 26.8
53.2% -6.0% Tragacanth Paste	White—2nd	Good	Good	Good	Paste 6.7
					Blood Albumen 13.4
53.2%- 2.5% Sodium Alginate Paste..	White—Best	Good	Excellent	Best	Pigment (T_1O_2) 53.1
					Thickening Paste .....

Hydrosulfite discharge on Direct and Developed Color	
Hydrosulfite discharge with pigment and albumen on Direct and Developed Color	

necessary to overcome this by added finishing operations and the addition of extra finishing materials. This additional washing and finishing costs money and slows production.

B. Color Yield

The color yield given by the sodium alginate paste is extremely good. The material has no reducing action, and this causes it to give good color value with Rapidogen, Pharmasol, Diagen, and Indigosol dyes.

C. Penetration

Sodium alginate paste is extremely smooth and free-flowing. Excellent penetration is obtained with the material. This property makes it very desirable for use as a thickener in discharge pastes, or for padding operations.

D. Sharp Printing Detail

The material works well in the printing machine; the prints have good sharp lines and the paste cleans out of the engraved roll nicely. There is no tendency for the formation of foam in the color box or for pin holes on the print.

3. PREPARATION OF PRINT PASTE IN THE PLANT

The method needed to prepare the paste is important because in the case of many materials the method used in preparing the paste determines the physical characteristics of the paste obtained. Many of these materials require such careful preparation that it is almost impossible to always obtain uniform pastes under the conditions prevailing in the average color shop. With sodium alginate, pastes are easily made and the method readily standardized for uniform results.

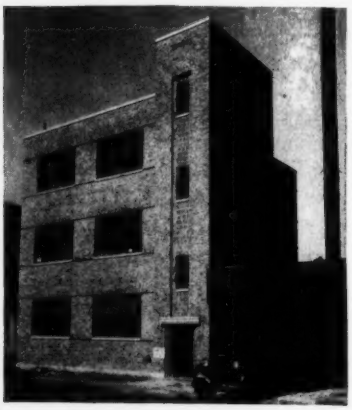
The easiest way to prepare the sodium alginate paste is to disperse the material in a barrel by use of an electric mixer. Water at room temperature is used and the sodium alginate powder is added while the water is being agitated. The mixer can be run until complete solution is obtained, or the paste can be set aside for an hour or two and then ten to fifteen minutes agitation with the mixer will bring complete solution. Some plants that use sodium alginate make the paste in a regular starch kettle. It is necessary to add the material carefully to avoid lumping. Cold water is used and the agitation in the kettle is continued until a smooth solution is obtained. This usually takes two to three hours.

4. LIMITATIONS ON THE USE OF SODIUM ALGINATE IN PRINT PASTE

Sodium alginate is a neutral material (Ph-7.0-7.5) and it does not enter into chemical reaction with any of the chemicals commonly used in printing. However, it is a salt of alginic acid and is precipitated by strong acids such as sulfuric or hydrochloric acid. Basic colors precipitate sodium alginate and it is not possible to use it successfully in print pastes with Basic dyes. This also holds true for its use with the Naphthol Salt colors.

• NEW COMMONWEALTH LABORATORY

Announcement has been made recently of the opening of new and up-to-date laboratories by the Commonwealth Color & Chemical Co., Nevins, Butler & Baltic Sts., Brooklyn, N. Y. A modern three-story building houses these laboratories which include research, application and manufacturing control laboratories for textiles, leather and allied trades. They are all equipped with the latest in laboratory appliances, Monel metal being used wherever practical. Special features include efficient lighting which gives a daylight effect and modern cooling and drying systems. The color types are housed in a special room and are arranged in a very practical and new manner. The interior has been painted throughout with aluminum paint, thus presenting a clean bright appearance.



New Laboratory Building

Diesel Engine Equipment

The personnel of the research laboratory has been increased with the result that now all three laboratories are well and efficiently staffed with trained chemists and practical application technicians. Ample rest rooms, wash rooms and a shower bath have been provided.

A unique feature of the new Commonwealth layout is the installation of a three-unit Diesel plant to produce its own power and light. It is understood that this is one of the first units of this type and size of engine to be installed in this country.

The Commonwealth firm started in business twenty-seven years ago and manufactures a line of dyes and chemical specialties which are well established in many trades, including the textile, leather, paint and varnish fields. Some years ago this firm acquired the Color Service Corporation and the Klipstein Color & Chemical Co. and more recently, in line with its program of expansion, acquired the Newbert Color Co. of Boston, which it continues to operate as a unit to serve its New England customers. Branch offices are maintained in Chicago, Philadelphia, Charlotte, Gloversville and Montreal.

A cordial invitation to visit the new laboratories is extended to the customers and friends of Commonwealth.

Research Control Laboratory

Textile Application Laboratory

Leather Application Laboratory

• ASTM SOAP COMMITTEE

At a very interesting series of committee meetings held in New York City on October 31 and November 1, Committee D-12, of the American Society for Testing materials, on Soaps and Detergents, approved a number of constructive actions in its work involving the formulation of specifications, methods of tests and definitions pertaining to soaps and detergents including the materials entering into their manufacture. All of the actions taken affecting new specifications or changes in existing items will be referred to the Society for approval prior to their official publication.

All told there were some 15 meetings of the main committee and its subcommittees and their sections.

As a result of the work of Committee D-12 the Society has already issued eight standardized specifications; four methods of testing covering particle size, sampling and chemical analysis of soap and soap products, analysis of sulfonated oils and chemical analysis of special detergents; also several definitions covering terms relating to soaps and detergents.

The section on specifications for sulfonated detergents (J. B. Crowe, General Engineering Division, Procter & Gamble Co., chairman) is carrying out a series of comparative washing tests on soiled cloth to develop some satisfactory method of measuring detergency. The work on standardized requirements for special detergents was advanced by approving proposed specifications for trisodium phosphate and sodium meta-silicate developed by a section on special detergents (C. C. Ziegler, Swift & Co., chairman).

At the meeting of the group concerned with methods of testing special detergents (W. H. Koch, Mathieson Alkali Works, Inc., chairman) there was discussion of work under way in preparing methods of analyzing for trisodium phosphate and sodium metasilicate and methods of test for carbon dioxide were also reviewed.

The section on tests for soaps (M. L. Sheely, chairman, representing American Oil Chemists Society, Armour & Co.) is working on the McNicoll method for rosin in soaps, and has developed some very interesting results. The members are also doing cooperative work on the carbon dioxide determination in soaps, but since not all the collaborators had reported on the cooperative samples, the report was one of progress to be completed before the 1939 spring meeting. This section also discussed water insoluble matter in soap; Wijs iodine test, etc.

Consideration of the existing Tentative Specifications for Chip Soap (D 496 — 38 T) and for Powdered Laundry Soap (D 498 — 38 T) by the subcommittee on specifications for straight soaps (Israel Katz, J. Eavenson & Sons, chairman) resulted in the recommendation to eliminate the word "laundry" in the specifications and under the scope clause substituting the following paragraph for the existing one:

These specifications cover chip soap (or powdered soap) suitable for washing, cleaning and scouring processes with soft water, when the presence of alkaline salts is not desirable.

The idea of these changes was to eliminate any idea that these soaps were suitable only for laundry purposes. This section also discussed soft soaps and green soap.

Committee D-12 has two committee sections on dry cleaning detergents—one concerned with methods of testing, the other, specifications, and at a joint meeting of these groups progress was made in drafting standardized requirements for dry cleaning soaps and detergents.

Considerable progress was made in writing specifications for soap powders and built soaps by the section on these materials (Frederick Krassner, U. S. Navy, Naval Clothing Depot, chairman). The committee hopes to have complete specifications drafted for both of the items by the 1939 spring meeting of the committee. Standardized requirements for these materials have been subject to much discussion because of divergent viewpoints, but the committee believes that many of these have now been reconciled.

Another difficult subject on which the committee is working is that of metal cleaners. A meeting of the section on these materials was held (J. C. Harris, Monsanto Chemical Co., chairman) and progress was reported. The committee in charge of developing specifications for textile soaps (C. L. Nutting, Arlington Mills, chairman) considered requirements for palm oil soap and as a result of discussion of a number of points this work was forwarded.

Subcommittee III on Nomenclature and Definitions (Frederick Kenney, Consulting Chemist, Stevenson Rd., Hewlett, N. Y., chairman) reported considerable progress in writing definitions, particularly on the controversial subject, soap powder. The Government specifications have called for a minimum of 15 per cent of soap in soap powders and yet there is a big field in which soap powders with lower soap content have been used. To iron out this difficulty, definitions have been proposed for consideration which in rough read as follows:

Built Soaps—to contain a minimum of 50 per cent of soap.

"Break" Soap Powders to contain 15 per cent to 50 per cent of soap.

Soap Powders to contain 15 per cent or 25 per cent of soap.

Soapy Washing Powder or Detergents to contain 2 per cent to 15 per cent soap.

There has been much confusion in the use of the terms soap powders, etc., and the committee believes that some such definition as proposed will clarify this condition. This definition will again be considered at the next committee meeting.

The committee would welcome comments and suggestions on these proposed soap powder definitions, from any interested parties. Comments can be sent direct to the chairman, Mr. Kenney, to the D-12 officers, or through the A.S.T.M. headquarters office.

General arrangements for these meetings of Committee D-12 were made by the chairman, H. P. Trevithick, New York Produce Exchange, 2 Broadway, N. Y. C., with the aid of B. S. Van Zile, Colgate-Palmolive-Peet Co., 105 Hudson St., Jersey City, N. J., secretary. F. W. Smither, National Bureau of Standards, Washington, D. C., is vice-chairman of Committee D-12.

• SYNTHETIC CHEMICAL PRODUCTION

In the past two decades, the synthetic organic chemical industry, with its thousands of products ranging from delicate perfumes to building materials, has from a relatively small beginning become one of the most important branches of the American chemical industry, according to T. W. Delahanty, Acting Chief of the Commerce Department's Chemical Division.

Synthetic chemicals, including solvents, plastics, anti-freeze and anti-knock preparations, benzol, carbolic acid, alcohols, soap substitutes, rubber chemicals, plastics, camphor, perfumes, flavors, dyes and medicinals, and a host of other coal-tar and non-coal-tar products are now basis to many of the country's largest industries, he stated.

Dye production in the United States has increased tremendously in recent years, reaching the all-time total of 122,208,000 pounds in 1937 which compares with only 6,620,000 pounds in 1914, at which time the seven American producing plants were almost entirely dependent upon Germany for intermediate products.

Production of other finished coal-tar and non-coal-tar products has likewise shown enormous gains in recent years. In 1937 the output of finished and semi-finished synthetic organic chemicals totalled 3,471,000,000 pounds; production of coal-tar intermediates aggregated 947,000,000 pounds; and synthetic non-coal-tar products were recorded at 2,524,000,000 pounds statistics show.

The plastic branch of the industry has been characterized by the ever-widening

use of its materials in the manufacture of a thousand—odd products ranging from jewelry to wall paneling and from bottle caps to timing gears, according to Mr. Delahanty. Every home is made brighter today with the many uses to which these products are put. Dressing tables contain a colorful array of plastic containers and the same material is found in every other part of the home and its equipment, including cabinet panels, table covers, ash trays, and cutlery handles.

Because of the growth of the synthetic organic chemical industry, not only in the United States but in many of the world's other large industrial nations, and the expanding markets for such products, the Commerce Department's Chemical Division recently completed a world survey of the synthetic organic chemical industry which has been released recently.

This study, published in bulletin form, covers coal-tar and non-coal-tar products such as dyes, medicinals, perfumes, flavors, photographic chemicals, plastics, solvents, textile assistants, flotation reagents, synthetic rubber and camphor, tanning agents, anti-knock and anti-freeze preparations, detergents, refrigerants and many other well known products.

Government assistance to the synthetic organic chemical industry, foreign affiliations, cartels, research, and the outlook for the industry are among the many subjects treated in the study, which should prove of interest to all branches of manufacturing and trade. Teachers and students will find this volume useful as a reference book, it is believed.

The survey was undertaken by C. C. Concannon, Chief, and J. N. Taylor, of the Commerce Department's Chemical Division to supply American chemical and related industries with information regarding outlets for their products in foreign countries and to acquaint them with competitive conditions and other data in connection with this fast-growing industry. The study known as Trade Promotion Series No. 189, "Synthetic Organic Chemicals — World Developments and Foreign Markets," may be obtained either from the Superintendent of Public Documents, Washington, D. C., or at any of the District Offices of the Bureau of Foreign and Domestic Commerce located in commercial centers in the United States at 20 cents per copy.

• TEXTILE INVENTORY POLICIES

The Textile Foundation today announced a grant for financing a study on Textile Inventory Policies and Statistical Guides. This study follows the one on Vertical Integration in the Textile Industries which was financed by the Textile Foundation and completed last June. The new project, like the previous one, was recommended to the Textile Foundation by the Committee on Economic Research of the United States Institute for Textile Research and has been approved, as was the last study, by the presidents of the Association of Cotton-Textile Merchants of New York, the Cotton-Textile Institute, and the National Association of Wool Manufacturers. It has also been endorsed by the Advisory Committee on Economic Research of the Textile Foundation.

Textile history of the last few years has given emphasis to the importance of the new study, and it is felt by those who have studied the new project that its completion will be awaited with keen interest by all sections of the textile industry.

This research project as presented to the Foundation is described as follows by the Committee on Economic Research.

"The various branches of the textile industry have suffered greatly from the effects of violent fluctuations in buying. These effects have been due, at least in part, to inadequate knowledge of commitments and inventories and sales at each state in the channels of distribution from mill to consumer. There has been a lack of danger signals, which, by focussing attention on inventory trends, would serve as a warning of approaching trouble and enable better control to be exerted by the various factors in the textile industry. It is one purpose of the report to review what has happened in the past few years in connection with inventories and their effects on operations. Another purpose of the proposed project is to show the degree to which present statistical information is adequate and inadequate, to indicate the relative importance of these factors at any given time, and to recommend how and wherein such statistical data should be expanded.

In order to accomplish the above, the following specific studies should be included in the research:

(1) A review of inventory trends and policies in recent years, at each stage of marketing between fiber and finished consumer product, covering different major classifications of textiles.

(2) An analysis of such changes as have occurred and their causes and effects upon textile activities, both seasonal and cyclical, and for different types of textiles.

(3) An analysis of the guides now used in formulating inventory policies in the production and distribution of particular products.

(4) Suggestions for improved handling of commitments and inventories based on the above history and analysis.

(5) Suggestions as to what further statistical information is necessary and how it can be obtained, distributed and used—for each major textile classification and at each stage between mill and consumer."

The new project will be under the advisory supervision of the Committee on Economic Research of the U. S. Institute for Textile Research, and the Industrial Research Department of the Wharton School of the University of Pennsylvania, which handled the previous study of Vertical Integration, has been invited to undertake the work.

It is felt that the new project will be an important successor to the other projects in economic research already sponsored by the Textile Foundation.

• S. P. T. GATHERING

On Thursday evening, November 4th, the Impregnole Corporation, manufacturers of the nationally known water-repellent compound Impregnole played host to a large meeting of the Alumni Chapter of the Sigma Phi Tau Fraternity.

The Sigma Phi Tau Fraternity is a textile group composed of graduates of the various textile schools from all parts of the country.

Charles M. Hayman, General Manager of the Impregnole Corporation described in detail, the benefits and uses of Impregnole as applied to textile fabrics of all fibers. The unique method of following their product through beyond the retail point of sale and labelling and promotional work done with retail outlets in all parts of the country.

Mr. Hayman explained how this modern textile finish, known as a one-bath water repellent method, on which the corporation holds U. S. Patents, is merchandising their entire operation.

He gave in detail, the facts as to how garments processed with Impregnole can be retreated at the local laundries, thereby making this finish perpetual . . . and also their distribution of Impregnole bottled for home use.

The meeting held at the offices of the Impregnole Corporation, 580 Fifth Avenue, New York, N. Y., is one of many planned by this group..

• CYANAMID EXPANSION

American Cyanamid & Chemical Corporation, 30 Rockefeller Plaza, New York, N. Y., has purchased from the Seaboard Air Line Railway a seventy-two acre tract of land at Georgetown, South Carolina, and from the Atlantic Coast Lumber Company the buildings situated thereon. The property is on the Sampit River and has dock facilities for vessels of thirty foot draft. The plant was formerly the site

of the lumber company's extensive operations and has large manufacturing buildings, including boiler house and office building. Mr. H. L. Derby, president of the corporation, has announced that construction and remodelling will begin at once and when completed will enable the Corporation to give better service to the trade in the Southeastern states.

The first unit to be installed will be a plant for the production of Sulphate of Alumina, a product used for water purification and in the manufacture of paper. The chemical plant under construction at Mobile, Ala., on ground recently acquired, is nearing completion. Other plants of the corporation in the south include those at Valdosta, Ga., Charlotte, N. C., Chattanooga, Tenn., and plants of partially owned companies at Panama City, Fla., Brownfield and O'Donnell, Texas. The corporation also owns Bauxite mines at Andersonville, Ga., and at Little Rock, Ark.

American Cyanamid & Chemical Corporation also operates numerous plants in northern cities.

● NEW PRINTING DEVELOPMENT

Maas & Waldstein Co. of Newark, N. J., pioneer manufacturers of textile lacquers are about ready to announce the development of a new basic improvement in textile printing compounds. It is stated that present indications are that it will eliminate the faults of the present quick drying materials of nitrocellulose and synthetic compositions. They will show considerable advancement in this type of printing. A more definite announcement and full information regarding this product will be available very shortly.

● TO REPRESENT ARNOLD HOFFMAN

Effective November 1, Leonard G. Tubbs will represent Arnold, Hoffman & Co., chemical manufacturers, in New York City with headquarters at 350 Madison Ave. Mr. Tubbs is well known and highly regarded in the textile industry and exceptionally well qualified to represent one of the oldest chemical houses in the United States. For eleven years he was associated with the United States Finishing Co., at that time one of the largest dyeing, printing and finishing concerns in the country, having complete charge of all purchases from 1927 to 1930. From 1930 to 1937 he acted in a similar capacity for National Dyeing and Printing Company with plants in the United States and Canada; and from January to August, 1938, he served as assistant to the president of John Campbell & Co. In addition to the above activities, Mr. Tubbs also organized a cooperative purchasing plan for the Textile Dyeing and Printing Co. of America and the Richmond Piece Dye Works of Richmond, Va.

● ALCO HOSIERY SERVICE

For scientific service to hosiery manufacturers, the Alco Oil & Chemical Co. has added to their technical department a Frazier Testing Machine and complete apparatus for microphotography. It is stated that this service is available without obligation and manufacturers are invited to send in hosiery and hosiery finishes for tests and analyses, and complete reports will be returned promptly.

● NEW FOLDER

Carbide and Carbon Chemicals Corporation announces the publication of a new folder entitled "Amines." Known as "Chemical Group Folder No. 10," this publication is the second of a series of new pamphlets which are designed to present information on industrial organic chemical families. It describes and presents the principal physical and chemical properties of fourteen commercial amines. A convenient table shows the most important physical properties in a form in which they can be easily compared. It also includes their pH values in aqueous solutions and in the solutions of their soaps. Because amines are being used more and more extensively for emulsifying, neutralizing, saponifying, and as the basis for further syntheses, this presentation of properties in a concise form will be of value to many. Copies of "Amines" can be obtained from Carbide & Carbon Chemicals Corporation, 30 East 42nd Street, New York, N. Y.

● CIBA REVIEW

Copies of *Ciba Review*, Number 15, have recently been distributed. The theme of this number is "Pile Carpets of the Ancient Orient" and articles which carry out this idea are described by the following titles: Table of Dates; The Great Centers of Production of Ancient Oriental Carpets; The Dyeing and Knotting of Oriental Carpets; Nature and the Persian Carpet; Motifs in the Patterns of Oriental Carpets; Symbolism in the Oriental Carpet; The Use of the Oriental Carpet and Its Part in European Painting; Collectors and Collections of Oriental Carpets; Historical Gleanings; Scientific Notes. Included in this issue is a supplement on Sapamine F L, a softening agent. Claims made for this product include: neutral reaction; withstands hard water; does not alter the shade of dyed goods; has no adverse effect on the light fastness of dyed material; no tendering of the fiber; no precipitation of direct or acid colors in the dyebath; odorless; suitable for bleached goods; is recommended for use with anti-crease finish. Copies of this publication are available from the Ciba Company, Greenwich & Morton Sts., New York City.

● COLGATE DISTRIBUTOR

Announcement is made of the appointment of Scher Bros. of 222 Railroad Ave., Paterson, N. J., as local representatives for the entire line of textile soaps and specialties produced by Colgate-Palm-Olive-Peet Co. Robert Scher has been identified with the textile industry for over twenty years. The company distributes a complete line of alkalies, acids, other chemicals and specialties in Paterson and the Metropolitan area. Recently the company has formed the Chemical Corp. of America which acts as the dyestuff distributing branch of the company.

● ANNUAL MEETING, U.S.I.T.R.

The annual meeting, research conference and dinner of U. S. Institute for Textile Research, Inc., held at the Hotel Commodore on November 10th attracted a large and representative attendance of members and guests. According to Institute officials the most important features of the meetings were results of two of its researches reported confidentially to the sponsors of their financing, and which cannot be made public until a year hence. The results of a research on textile drying were considered so important that sponsors were telegraphed on Wednesday to meet at the Commodore to hear them explained privately.

The other outstanding features of the meeting were reports of two completed researches, and the announcements of the organization of two new studies. Of both the former and latter one is a scientific and the other an economic research. Completed is a study of the warp sizing of filament viscose rayon, and this has produced such satisfactory results of practical application since its start in 1936 that its sponsors have asked the Institute to undertake the organization and co-operative financing of a study of warp sizing of cotton and spun rayon; they have also requested that this be conducted in southern mills and laboratory.

The completed economic research was published in book form last summer and entitled "Vertical Integration in the Textile Industries." It was organized by the Institute's committee on economic research,

of which Mr. F. S. Blanchard of Pacific Mills is chairman, and conducted under the committee's auspices by the Wharton School of University of Pennsylvania. It was wholly financed by the Textile Foundation, and the directors of the latter have authorized another study, similarly organized and conducted, on the subject of "Textile Inventory Policies and Inventory Guides." This, like the former economic study, has the endorsement of the heads of the Cotton-Textile Institute, the National Association of Wool Manufacturers and the Association of Cotton Textile Merchants of New York, who serve with the Institute's committee in an advisory capacity.

Officers and Directors Elected

At the ninth annual meeting of the Institute, the president, Dr. Elvin H. Killheffer, presided. Formal reports were presented showing that the organization, excepting for its expanding research work, had made little more progress during the past year than the textile industry itself. Directors were elected for a term expiring in 1941, and officers were elected at the following meeting of the Board of Directors as follows:

Directors re-elected: F. S. Blanchard, Pacific Mills, New York, N. F.; Alban Eavenson, Eavenson & Levering Co., Camden, N. J.; Ernest N. Hood, treasurer, Old Colony Mfg. Corp., Taunton, Mass.; Prof. Louis A. Olney, Lowell (Mass.) Textile Institute; the president, ex-officio.

Directors elected for a three-year term expiring in 1941: Dr. F. Bonnet, American Viscose Corp., Marcus Hook, Pa.; Erb N. Ditton, Gotham Silk Hosiery Co., New York, N. Y.; A. M. Tenney, president, A. M. Tenney Associates, New York, N. Y.

Director elected to succeed Dr. H. DeW. Smith, resigned: Dr. A. C. Walker, Bell Telephone Laboratories, New York, N. Y., for a term expiring in 1940.

The following officers were re-elected: president, Dr. E. H. Killheffer, E. I. du Pont de Nemours & Co., Wilmington, Del.; secretary, Charles H. Clark; treasurer, E. N. Hood, Old Colony Mfg. Corp., Taunton, Mass.

To succeed Philip A. Johnson and Dr. H. DeW. Smith who resigned from the executive committee, the following were elected: Earl Constantine, president, National Association of Hosiery Manufacturers, and D. G. Woolf, editor, Textile World, New York, N. Y.

Warp Sizing Discussed

The afternoon session, starting at 2 P.M., was devoted to a discussion of the proposed new research on warp sizing of cotton and spun rayon. It was open to all interested in the subject and was largely attended. W. E. Emley, chairman of the Institute's research council, and chief, Organic & Fibrous Materials Division of the National Bureau of Standards, presided. The discussion was led by Harold M. Chase, Research Director, Riverside & Dan River Cotton Mills, Danville, Va., and Fred G. La Piana, Stein, Hall & Co., New York, N. Y. Wright Bolton, chairman of the Institute's administration committee for the warp sizing study since 1935, and agent, rayon division, Pacific Mills, reported on the results of that study to date, noting that its indirect results in stimulating improvement of sizing materials and processing equipment have vied with its direct results in their value to the industry.

Dinner Guests and Program

President Killheffer acted as toastmaster at the annual dinner, held in the West Ball Room at 7 P.M., and also delivered the principal address. Seated with him at the head table were the following guests and speakers: Claudius Murchison, president, Cotton-Textile Institute; W. Ray Bell, president, Association of Cotton Textile Merchants of New York; Edward T. Pickard, secretary and assistant treasurer, The Textile Foundation; Alban Eavenson, president, American Association of Textile Chemists and Colorists and a director of U. S. Institute; Louis A. Olney, chairman, Research Committee of American Association of Textile Chemists and Colorists and first vice-president of U. S. Institute; W. E. Emley, chairman of the Institute's Research Council; Fessenden S. Blanchard, chairman of the Institute's Committee on Economic Research.

The speaking program was as follows: The Institute's Research Program, by W. E. Emley, chairman, Research Council; The Institute's Economic Researches, by Fessenden S. Blanchard, chairman, Committee on Economic Research; President's Annual Address, by Dr. Elvin H. Killheffer.

● TEXTILE DEANS MEET

The Fall meeting of the Textile School Deans, was held in New York City with headquarters at the Commodore Hotel, the latter part of October. The Deans were guests of the Committee D-13 meeting of the American Society for Testing Materials on Wednesday, October 26th, and attended sessions dealing with cotton yarns and threads, cotton woven fabrics, rayon, rayon staple, wool, household and garment fabrics, and glass fiber.

Dr. Frederick M. Feiker of the Textile Foundation presided as Chairman during the conference, and after welcoming the Deans, turned the meeting over to Dr. E. W. France, Dean of the Philadelphia Textile School, who had arranged for a discussion on color and style. Before introducing the speakers, Dr. France pointed out that it was necessary for textile students and manufacturers to embrace a color conscience, since demands for color combinations were constantly shifting and changing. The importance of color as a sales appeal and the proper use of a weave to bring out the shades desired, was explained by Mr. Richard S. Cox of the Philadelphia Textile School. Recognizing that people are generally fond of one color and certain color combinations, Mr. Cox emphasized the fact that the textile student and manufacturers "can not love any color," but must appeal to public demands and create colors to meet the demands of all types of people, regardless of their own preferences.

Mrs. Maud Scholle, Stylist for the Pepperell Manufacturing Company, and a director of the Fashion Group in New York City, spoke on color from the marketing point of view, showing that the stylists' problems arise because of the necessity to offer the buyer new color combinations each year. Claiming that popular styles today require about a year and a half of "build up," Mrs. Scholle used an example the recent Victorian and Edwardian fashion craze. She illustrated her talk with new creations of the Pepperell Manufacturing Company, and explained how styles are also affected by news of world events, the theater, sports, etc.

Dr. W. E. Emley of the National Bureau of Standards, Department of Commerce and member of the Textile Foundation's Advisory Committee for Scientific Research, spoke on the scientific research activities of the Textile Foundation. Special attention was called to studies on the impurities in cotton, wool, silk, and other fibers, being made by Foundation research fellows at the National Bureau of Standards. Dr. Emley pointed out that the purpose of these studies is to bring to the textile industry the developments of scientific research and to make textiles a leader among industries. He also stated that the manufacturer who is aware of the advancement of science along these lines, and who makes use of this knowledge in the mill, will enjoy decided economic advantages. Referring to the Textile Foundation, Dr. Emley said that great credit was due that organization since it was assisting in removing the handicap caused by the lack of knowledge of scientific facts relative to textiles.

The last speaker of the morning session, Mr. Alston H. Garside, writer and economist of the New York Cotton Exchange, spoke on the cotton outlook, urging that the students be well grounded in the eco-

nomics of supply and demand, prices, and foreign exchange. He pointed out that textile students are the ones who will meet the issues that are bound to arise in the future, and consequently must be so trained that they will be able to exercise sound judgment in rendering their decisions.

After a group luncheon, to which a number of association executives were invited, the members attended the "Symposium on Spun Rayon and Blended Fibers," part of the program of the American Society for Testing Materials.

Dr. H. E. Michl of the Cotton Textile Institute was the first speaker of the Friday morning session on October 28th, discussing various textile problems of the day. He dwelt particularly on the revolutionary changes occurring in the textile industry, using as illustrations the cotton and wool markets. Dr. Michl recommended the use of the four books recently issued by the Textile Foundation, which he considered valuable contributions to the textile industry. The books he referred to were, "Management of a Textile Business," "Textile Costing—An Aid to Management," "Marketing of Textiles," and "The Textile Industries—An Economic Analysis."

Dr. Karl T. Compton, President of the Massachusetts Institute of Technology, was an unexpected and welcome guest. Dr. Compton, together with Dr. Robert E. Doherty, President of the Carnegie Institute of Technology, and Dr. E. C. Brooks, former President of North Carolina State College, composed the Textile Foundation's original committee on textile education.

The method of teaching the marketing of textiles in the School of Retailing of New York University, was discussed by Dr. Norris Brisco, Dean of the school, who illustrated his talk with student note books. He also showed how students are taught the fundamental characteristics of textiles, and the purposes for which the fabrics should be used.

The morning session was concluded by a talk on vicuna and the finer animal fibers, by Sylvan Stroock of S. Stroock & Company. Before treating the subject of textile fibers, Mr. Stroock made interesting observations pertaining to the textile school graduate, and implored the deans to develop individual characteristics and initiative in the students, and teach them an appreciation of color and art.

With the desire of bringing the deans in closer contact with textile executives, four luncheon groups were arranged with the following men serving as hosts: Mr. Robert Glassford, President of Bliss Fabyan & Co.; Mr. Frederic A. Williams, President of Cannon Mills; Mr. Elroy Curtis, Chairman of the Board of Southeastern Cottons, Inc.; and Mr. Theodore Wood, Director of Advertising, North American Rayon Company.

The afternoon session dealt with a discussion of the recent Textile Foundation report, "Vertical Integration in the Textile Industry." Mr. F. S. Blanchard, Chairman of the Committee on Economic Research of the United States Institute for Textile Research, and Mr. H. S. Davis of the Wharton School of Finance and Commerce of the University of Pennsylvania, one of the co-authors, presented papers touching on the high spots of the study. Mr. Blanchard defined "vertical integration" as a combination under one control of more than one step from the producer to the consumer. Based on the principle that all mills are interested in maintaining control over their own destiny, the book discusses reasons for the success and failure of certain integrated businesses.

The report by Dean H. H. Willis, Clemson College, on "Technical Text Material," closed the meeting. No definite plans were made for the spring session which will be held sometime in the early part of 1939.

The following were present: J. B. Bagley, Dean, Texas Textile College, College Station, Texas; E. W. Camp, Dean, Alabama Polytechnical Institute, Auburn, Alabama; Frank D. Cheney, Director, Textile Foundation, Manchester, Conn.; William H. Dooley, Principal, New York Textile High School, New York City; Chas. H. Eames, President, Lowell Textile Institute, Lowell, Mass.; W. D. Fales, Dean, Rhode Island School of Design, Providence, R. I.; Dr. F. M. Feiker, Textile Foundation, Washington, D. C.; Dr. E. W. France, Dean, Philadelphia Textile School, Philadelphia, Penna.; M. E. Heard, Dean, Texas Technological College, Lubbock, Texas; Franklin W. Hobbs, Chairman, Board of Directors, Textile Foundation, Boston, Mass.; C. A. Jones, Dean, A. French Textile School, Georgia School of Technology, Atlanta, Ga.; Dr. Thomas Nelson, Dean, Textile School, North Carolina State College, Raleigh, N. C.; Henry W. Nichols, Dean, Bradford Durfee Textile School, Fall River, Mass.; Edward T. Pickard, Secretary, Textile Foundation, Washington, D. C.; Harry J. Robinson, Textile Foundation, Washington, D. C.; George Walker, Dean, New Bedford Textile School, New Bedford, Mass.; H. H. Willis, Dean, Clemson College, Clemson, S. C.

● MEETING, A.A.T.T.

The last meeting of the American Association of Textile Technologists was held at the Architectural League Club Rooms on the evening of November 2nd, at which time 55 members and guests were present for dinner to be followed by a lecture. The speaker of the evening—Mr. Harold W. Brightman, Vice-President and General Merchandise Manager of L. Bamberger & Co., Newark, New Jersey—was introduced by Herbert Harriman Hatch, First Vice-President of the Association. After the lecture a lively discussion ensued at which time representatives from leading textile trade associations, weaving mills and rayon producers questioned the speaker on the subject of the evening. The next meeting will be held December 7th at which time the speakers will be: Charles B. Johnson, warp slashing machine manufacturer of Paterson, New Jersey, and W. L. Bentley of Thomas W. Dunn Company, who will speak on warp slashing and sizing compounds.

● CHEMICAL BUYER'S GUIDEBOOK

Users of the "Chemical Guidebook" number of Chemical Industries will note the addition of three new valuable and highly informative sections in the 1938 edition just published. The buying section on chemicals has been supplemented by buying sections on natural raw materials and industrial chemical specialties and also by a dictionary of nearly 20,000 brand and trade names with an identification of what each is and the maker. Thus for the first time buyers are provided with satisfactory information as to sources of supply of all types of chemical products.

Buyers of industrial chemical specialties used in a wide range of industries will find suppliers of every specialty from abrasives to zeolites. Plant and building maintenance items are fully covered. The technician and the buyer alike and all those in any way interested in the use of chemicals will find this "Guide" an indispensable tool.

As in the past 13 editions, the latest provides under each of the 2,846 raw material, chemical and chemical specialty headings, complete technical data, including formula, molecular weight, other physical and chemical properties, uses, containers, etc., so that the book is really two books in one, a buyer's guide and a chemical dictionary.

The Company Directory Section is a complete and up-to-date address book by manufacturers, importers, and local distributors, arranged geographically by states and cities. The buying sections are completely cross-indexed and all the commercial and technical synonyms are listed in the index. The annual high-low quotations for the past five years on over eleven hundred commercially important chemicals, raw materials, etc., are given.

Also a very complete list of associations and societies together with the officers' names and addresses. The 14th edition, containing 624 pages, is almost twice as large as the previous one, and three times as large as the 1934 edition.

● DIESEL ENGINES

Diesel Engines, of the type recently installed at the plant of a prominent chemical manufacturer, are available from the Pioneer Equipment Corporation of America, Woolworth Bldg., New York City. The type installed is the Modaag-Krupp two stroke cycle Diesel Engine type RB 43. Connecting rod and crankshaft are of Krupp steel; piston, cylinder liner and cylinder head are made of perlitic cast iron. It is stated that this new material does not contain any alloys and has uniform, fine structure, high tensile strength and a low factor of friction; further that it is indifferent to sudden temperature changes and can withstand better the high temperatures prevailing in the Diesel engine; also the parts can be made lighter and friction, as well as wear and tear, is reduced to a heretofore unknown minimum. Each cylinder is provided with a separate fuel pump assembled in one block, but independently driven and adjustable. This model is started by compressed air and it is claimed that, even in cold weather, the engine will start immediately. It is also claimed that all Modaag-Krupp Diesel Engines have an extraordinarily small consumption of fuel oil. It is stated that this is due to the properly designed combustion chamber, the exact and accurate governing of the fuel injection, and correct atomizing of the fuel charge. It is further said that the operation of the engines is exceptionally economical even under low and fluctuating loads. Full details of construction and operation of the Modaag-Krupp Diesel Engines are described in a booklet which is available upon request to the distributors.

BOOK REVIEWS

Chemical Tables from Handbook of Chemistry and Physics. *Charles D. Hodgman, M.S.* 1,383 *pages. Published by Chemical Rubber Publishing Co.,* 1900 *West* 112*th Street, Cleveland, Ohio.*

This book consists of 1,383 pages of the material which appears in the new and enlarged 22nd Edition of the Handbook of Chemistry and Physics which contains 2,090 pages.

The object of this abridged edition is to present a separate volume of chemical tables which includes all material of the larger Handbook which is of direct and particular interest to chemists, together with a generous selection of the more valuable tables of general character and features of special usefulness. This will prove of special advantage to students in that they may secure practically all of the material appearing in the larger book, which they need, at a considerably lower cost.

L. A. O.

Handbook of Chemical Microscopy. *Volume I, Second Edition, by E. M. Chamot and C. W. Mason.* 478 *pages,* 165 *Illustrations. Price,* $4.50. *Published by John Wiley & Sons, Inc.*

The first edition of this book was published in 1929 but in the present volume the authors have revised the book to keep it in line with the great progress of chemical microscopy which has been made in recent years.

Chemists have come to appreciate more and more the usefulness of the microscope in chemical examination and analysis. With this in mind the authors have expanded and rewritten much of the material dealing with the study of crystals, fibrous materials, particle size, photomicrography and preparation techniques.

Volume I together with Volume II which goes into more detail concerning chemical methods and Inorganic Qualitative Analysis, constitute by far the most complete work upon the subject of chemical microscopy that has been published.

Every laboratory possessing a microscope, and practically all chemical laboratories do today, will find this book of great value both for reference and study.

L. A. O.

CLASSIFIED

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

WANTED: Position open in Textile Specialty House, Philadelphia vicinity for Chemist with Cotton and Rayon finishing and dyeing experience, preferably one familiar with the make-up and manufacture of oils, softeners, sizes, etc., used in the industry. Good future assured to the proper man. Permanent position. State expected salary in first letter. Write Box No. 160, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED: Colorist, Graduate chemist. Eleven years' experience all types of fabrics. Specializing on rayon. Eight years dyestuff laboratory and demonstrating. Excellent references. Age 36. Married. Write Box No. 162, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.